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GUEST EDITORIAL · BYGEDRAAGDE INLEIDINGSARTIKEL

BARAGWANATH HOSPITAL
DECENNIAL ANNIVERSARY

In this issue of *Medical Proceedings* we publish the profit and loss account of Baragwanath Hospital after 10 years in business—the business of healing wounds, treating illnesses, easing birth pangs and generally assuaging the ills of mankind on its journey through the seven ages. It is a stocktaking without which the degree of progress cannot be evaluated and which affords an opportunity for an organization to slow down, look back to the point it set out from and help to chart a course for the future.

Inevitably, the first question must be, why the rush? After only 10 years it might well seem a trifle presumptuous to place on record a history of our life and times and exhibit all the signs of delivering ourselves of a premature autobiography.

Maybe it is, although I have never been one of those who maintain that wisdom can only come with age. I have known many men in my time who have only acquired hardening of the arteries and hardening of ideas before arriving at the gate of the years. Immemorial elms, ivy covered walls and timeless towers can, and all too often do, imply a sterile, academic outlook and become indifferent and unreceptive to modern change.

Such criticism should not arise in the mind of a doctor, because of the kaleidoscopic changes in the nature and treatment of disease.

For instance, antibiotics and advances in preventive medicine have altered the whole concept of disease by eliminating infection as a potent cause of death. True, the balance has unfortunately been redressed in half a genera-

BARAGWANATH-HOSPITAAL
TIENJARIGE JUBILEUM

In hierdie uitgawe van *Mediese Bydraes* publiseer ons die wins- en verliesrekening van Baragwanath-hospitaal nadat ons 10 jaar lank besigheid gedryf het—die besigheid, naamlik, om wonde te genees, siektes te behandel, geboortepyne te versag, en oor die algemeen die kwale van die mens op sy reis deur die sewe stadiums van die lewe te verlig. Dit is 'n voorraadopname waarsonder dit onmoontlik is om die mate van vooruitgang te meet, en wat die organisasie tegelykertyd 'n geleentheid bied om vir 'n oomblik stil te staan, om terug te kyk op die pad wat reeds afgelê is, en om ons weg vir die toekoms te probeer bepaal.

Die eerste vraag wat waarskynlik gestel sal word, is: Waarom so haastig? Na 'n bestaan van slegs 10 jaar is dit miskien 'n bietjie voorbarig om nou al 'n geskiedenis van ons lewe en ons tyd op skrif te probeer stel, en om al die tekens te toon dat ons op die punt staan om geboorte aan 'n ontydige lewensgeskiedenis te gee.

Miskien is dit te vroeg, hoewel ek nog altyd een van diegene was wat volhou dat wysheid nie noodwendig saam met die jare kom nie. In my tyd het ek baie manne geken wat slegs met verkalkte slagare en verkalkte idees voor die poort van die jare te staan gekom het. Eeue-oue olmbome, mure wat dig met klimop berank is, en torings wat die aanvalle van die jare weerstaan het, is veels te dikwels die uiterlike simbole van verstokte akademiese sienswyses wat onverskillig en onontvanklik vir moderne veranderings geword het.

tion by the appearance of new diseases induced by the stresses of our much vaunted and advancing state of civilization; but this only proves my point that the currents of medical thought are swift and changing and allow of little delay in their application. I make therefore no apology for the precocity of Baragwanath Hospital.

This healthy, lusty vital organism has accomplished a great deal in the last 10 years and shows even greater promise for the future.

Its vital statistics are themselves breathtaking and startling—1,600 beds soon to be increased by a further 740; close on half-a-million outpatients annually; over 160 full-time doctors half of whom are, while the other half are being trained to become, specialists; over 800 nurses, 230 of whom are qualified; an annual expenditure exceeding £1,500,000 excluding capital costs; 46 wards; 10 of the most modern and best equipped surgical theatres in the country; the building of 6 and the taking over of a further 8 peripheral municipal clinics; these represent only the bare bones of our story.

We meet and treat every condition under the sun. At Baragwanath the unusual becomes commonplace, the wards often resembling living medical museums. Visiting scientists of world-fame and renown are amazed at the multiplicity and variety of diseases and their manifestations, which are seldom seen outside textbooks. The very latest trends in medicine, surgery, paediatrics, obstetrics and gynaecology, neurology and surgical neurology, thoracic and cardiac surgery, radiology, anaesthiology, plastic and cosmetic surgery, pathology, aural and ophthalmic surgery—the list is endless—are carefully studied and applied. A spirit of scientific enquiry pervades the hospital from the highest to the lowest. We point with pride to the 220 original contributions to medical science, which have appeared in learned medical periodicals throughout the world and have elicited frequent enquiries for reprints and opinions.

Baragwanath has trained hundreds of clinicians and its alumni are to be found throughout the world wherever doctors congregate.

We ask to be judged by the sense of devotion, dedication and the cool appraisal of the ceaseless gathering of scientific data. By those standards our balance sheet must stand or fall. Few will disagree that the effort has not been worth while.

I. Frack, M.B., Ch.B.,
Medical Superintendent.

Baragwanath Hospital,
Johannesburg.

Oor hierdie soort kritiek hoef 'n geneesheer hom egter nie te bekommer nie, want hy kry gedurig te kampe met kaleidoskopiese veranderings in die aard en behandeling van siektes.

Byvoorbeeld, antibiotica en die vordering wat daar op die gebied van preventiewe geneeskunde gemaak is, het die hele siektebegrip verander deur infeksie as 'n belangrike oorsaak van die dood uit te skakel. Weliswaar is die ewewig ongelukkig binne 'n halwe geslag herstel deur die verskyning van siektes wat regstreeks gewyt moet word aan die spanning voortspruitende uit ons hoog geroemde en vinnig vorderende beskawing. Maar dit bewys slegs die punt wat ek wil benadruk, naamlik dat die gety van geneeskundige denke vinnig vloei en veranderlik is, en dat ons nie kan talm met die toepassing daarvan nie. Ek bied derhalwe geen verskoning vir die voorbarigheid van die Baragwanath-hospitaal aan nie.

Hierdie gesonde, kragtige en lewenslustige organisme het veel gedurende die afgelope 10 jaar tot stand gebring en gaan 'n selfs belowender toekoms tegemoet.

Sy statistieke is asembenemend en opspraakwekkend—1,600 beddens wat binnekort met 'n verdere 740 vermeerder sal word; ongeveer 'n halfmiljoen buitepasiënte per jaar; meer as 160 voltydse doktors, van wie die helfte reeds spesialiste is, terwyl die ander helfte as spesialiste opgelei word; meer as 800 verpleegsters van wie 230 gekwalifiseer is; 'n jaarlikse uitgawe van meer as £1,500,000, uitsluitende kapitaalkoste; 46 sale; 10 van die modernste en bes toegeruste operasiesale in die land; die bou van 6 en die oorname van 'n verdere 8 buitestedelike munisipale klinieke—daar het u maar net die agtergrond van ons verhaal.

Ons kry te kampe met en behandel alle moontlike toestande. Die buitengewone het by Baragwanath alledaags geword, met die gevolg dat die verskillende sale soms na lewendige geneeskundige museums lyk. Besoekende wetenskaplikes wat wêreldbekendheid en wêreldroem verwerf het, staan verstom oor die menigvuldigheid en die verskeidenheid van siektes en siekte-manifestasies wat selde buite die omslag van handleidings teëgekom word. Die allerjongste wendinge op die gebied van geneeskunde, chirurgie, kindergeneeskunde, verloskunde en ginekologie, neurologie en chirurgiese neurologie, borskas- en hartchirurgie, radiologie, anestesie, plastiese en kosmetiese chirurgie, patologie, oor- en oftalmiese chirurgie—die lys is byna sonder end—word sorgvuldig bestudeer en toegepas. Die hospitaalpersoneel—van die hoogste tot die laagste—is besiel met die gees wat ten grondslag van wetenskaplike navorsing lê. Ons wys met trots op die 220 oorspronklike bydraes tot die mediese wetenskap wat in gesaghebbende mediese tydskrifte dwarsdeur die wêreld verskyn het en wat dikwels navrae in verband met herdrukke en verdere menings aan die lesers van daardie tydskrifte ontlok het.

Baragwanath het honderde medici opgelei, en sy alumni word dwarsdeur die wêreld—oral waar doktors saamkom—aangetref.

Ons vra dat ons beoordeel moet word aan die hand van ons toegeneentheid en toewyding, en 'n kalme evaluasie van ons nimmereindigende insameling van wetenskaplike gegewens. Volgens hierdie maatstawwe staan of val ons balansstaat. Daar is min wat nie sal saamstem nie dat die poging die moeite werd was.

I. Frack, M.B., Ch.B.,
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TEN YEARS' MEDICAL EXPERIENCE AT BARAGWANATH NON-EUROPEAN HOSPITAL

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Having worked at this Hospital for 10 years it is possible to report on medical experience in the non-European patient with some authority. There are 354 medical beds for the Bantu races and 25 for the Coloured and Asiatic.

Acute, subacute and chronic cases have been admitted during their more severe periods of illness.

The staff, employed full-time, consists of a Senior Physician, 3 Physicians, 3 Assistant Physicians, 7 Registrars and 16 Intern and Resident appointments. Four Units have been formed, each with 76 beds; 30 beds are under a Specialist Dermatologist and 20 beds are used for female primary psychotic patients.

When the Hospital opened 10 years ago the bulk of the work concerned the acutely sick with serious organic disease. With increasing confidence in European standards of medicine, the subacute and chronic sick, including the hysteric and psychotic patient, now attend the Hospital so that the experience simulates European hospital practice more closely and work here represents unselected material from the Native townships of Johannesburg. The number of patients requiring admission to hospital has therefore increased considerably in recent years and rapid turnover is now necessary to accommodate the patients. During August 1957, 847 patients were admitted to 349 general medical beds, the week-day intake varying from 13 to 36 per day and the Sunday from 9 to 18. The pavilion style hospital in garden surroundings has encouraged rapid convalescence. As judged by my experience in 3 London teaching hospitals, the equipment and supplies have been good, up-to-date and liberal.

Sympathetic patient-doctor relationship has been successfully achieved in the subacute and chronic sick. With patience, a good history can always be elicited, especially with the appropriate interpreter-nurse for the language concerned and provided the patient's mental faculties have not been damaged by disease. In addition, the non-European patient is most responsive to sympathetic handling and patient explanation and it is unusual for the patient to ignore medical and surgical advice. Relatives, likewise, are understanding and seldom interfere with accepted medical practice.

After discharge from hospital, economic necessity makes it impossible for any but the chronic sick to attend the Out-Patient Department.

Spoken and written statement concerning the incidence and behaviour of disease in the Bantu races has sometimes been made with which my experience cannot agree. The response to infection (including tuberculosis) and the ability to recover from it does not differ between the European and the non-European. Tuberculosis is not more frequent in the vitamin deficient and malnourished and, furthermore, if the two are associated the recovery from the tuberculous infection has been satisfactory. Diabetes mellitus is seen frequently in the Bantu and its response to treatment does not differ in the races. In spite of the usually dry and sunny climate, rheumatic heart disease is very common and frequently severe in the child and adult. Hypertensive heart disease, arteriosclerosis, malignant hypertension and cerebral thrombosis are common diseases amongst the Bantu patients. Infective hepatitis has been frequently recorded. Indeed, apart from a few notable exceptions, medical experience at this Hospital indicates that the European and non-European patients do not differ so strikingly, either pathologically or psychologically, as previously believed. Myocardial infarction has been extremely rare during 10 years. Vitamin deficiencies, pellagra, scurvy, follicular hyperkeratosis and ariboflavinosis are commonly seen in the Wards. Hunger oedema in the adult is rare. Demyelinating nervous disease is extremely rare.

During the last 2 years junior non-European doctors have been working at Baragwanath Hospital. The standard of work and the relationship with the Bantu and Asiatic colleagues has been satisfactory and I am convinced that they will establish for themselves an important place in both general and consultative practice in South Africa.

I have also been very favourably impressed with the ability of the non-European nurse. For the past 2 years the Medical Wards have

* Senior Physician.

been administered and worked entirely by her. Her standard of work can be as good as any I have experienced in London hospitals. Not only can she excel in efficiency but also in all the sympathetic qualities the patient requires for physical and mental well-being. The success of our nurse at this Hospital has been very largely achieved by the fine example of our matron and her senior European nursing administrative staff and the very well organized and sympathetic teaching in our Nurses Training School. The work of our nurses is especially praiseworthy when the rapid turnover and overwork is remembered. Mistakes in nursing, I have found, can usually be attributed either to indistinct written and spoken instruction or to gross overwork.

Academically Baragwanath Hospital has offered great opportunities for the study of unselected medical hospital material, and has provided a fine undergraduate and post-graduate training.

OPSOMMING

Die mediese ondervinding by die Baragwanath-hospitaal vir nie-blankes gedurende die afgelope 10 jaar word in oënskou geneem.

Die merkwaardige groei en ontwikkeling van die hospitaal en sy werk word kortliks geskets.

Die belangrikheid van die akademiese geleenthede wat deur die Baragwanath-hospitaal gebied word, word besef, en die aandag word gevestig op die voortreflike opleidingsfasiliteite wat tans tot beskikking van nie-gegradueerdes en na-gegradueerdes gestel word.

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Mr. H. D. Haywood (*Head of the Registry Department*).

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IN MEMORIAM

JOHN DONALD ALLEN, *O.B.E.*

1900–1957

Medical Superintendent, Baragwanath Hospital, 1947–1957

J. D. Allen was a man of outstanding ability, with a deep knowledge of human nature and beloved by all who knew him. Born in Port Elizabeth, he studied at St. Bartholomews Hospital, London and qualified in 1924. Returning to South Africa, he practised for a while in South West Africa, then settled in Knysna, Cape Province, where he practised for many years and held the post of District Surgeon.

He came to Johannesburg, and was associated with the Silicosis Bureau, until the outbreak of World War II. He served throughout the war and returned with the rank of Colonel S.A.M.C.

He then joined the Transvaal Provincial Administration as Medical Superintendent, Germiston Hospital, and was subsequently transferred in a similar capacity, in 1947, to Baragwanath.

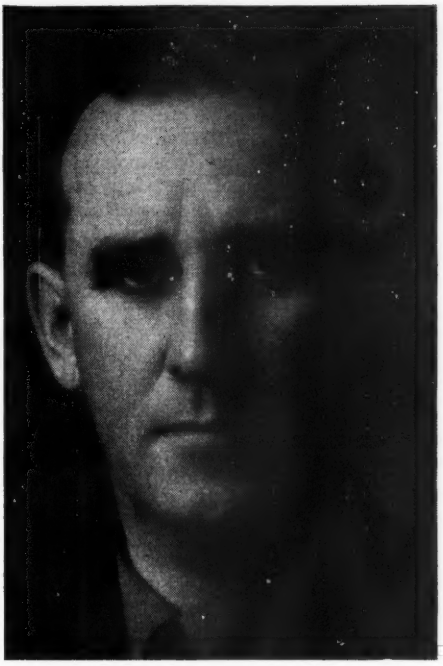
Kindly and understanding to his subordinates, with a gift for making allowances for human frailties, he was born to command and forthright in his opinions.

Fortiter in re, suaviter in modo could justly be applied to the late 'Jos' Allen.

The J. D. Allen Surgical Theatre block stands as a monument to his honesty, integrity and inspiring leadership.

Ave atque Vale!

I. Frack.



Dr. J. D. Allen

TEN YEARS OF BANTU PAEDIATRICS

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The paediatric section at Baragwanath Hospital opened in March 1948, when it replaced the overcrowded children's wards at the Non-European Hospital. The unit was headed by the late Dr. Alfred Altmann, who was then already internationally known for his work on protein malnutrition (malignant malnutrition, kwashiorkor). He had revolutionized the treatment of this condition by recognizing that it was primarily a protein deficiency and not a vitamin deficiency syndrome.[1] By the use of an acidified skimmed milk Altmann was able to reduce the mortality of protein malnutrition considerably. Before his tragic death in 1950 he completed 2 papers summing up his work on malnutrition.[2, 3]

* Senior Paediatrician.
† Paediatrician.
** Assistant Paediatricians.
‡ Registrars.
§ Deceased.

Throughout its existence, the Paediatric Unit at Baragwanath has had difficulties in satisfying the demands of the rapidly growing African population of Johannesburg. Out-patient attendances have increased from 13,500 in 1949 to nearly 90,000 in 1956. During the past 10 years over 500,000 children under the age of 9 years have received treatment at the Paediatric Out-Patient Department, and more than 30,000 have been admitted to our wards. At present the Unit provides accommodation for 213 children up to 9 years of age. A Unit many times this size is required to satisfy the immediate needs of the local population. A detailed description of the Unit cannot be given here, but it may be worth mentioning some of its distinctive features:

1. The nursing staff consists entirely of non-Europeans and includes 5 fully trained ward sisters;
2. Mothers of breast-fed infants are accommodated in the hospital, because prolonged breast-feeding is essential for the survival of infants after discharge from hospital;
3. The unit works in close co-operation with the municipal clinics which take over the treatment of most of the children suffering from tuberculosis, and which provide after-care for children discharged from hospital. This enables us to send patients home long before recovery is complete and to maintain a rapid discharge rate;
4. The turnover of patients is further increased by a Subacute Ward of 20 beds and 20 cots, staffed by 3 staff nurses and nurse aids. An average of 200 cases per month passes through this ward alone. In the infants' wards with a total of 66 cots, 200–300 patients are admitted per month;
5. Standardization of feeding formulae enables the Unit to prepare up to 750 feeding bottles a day in a milk kitchen measuring 9 feet by 12 feet;
6. The Paediatric Section maintains the largest premature baby unit in South Africa, details of which will be given later in this paper;
7. Owing to shortage of accommodation in the wards, many complex cases are investigated at the Out-Patient Department where complicated clinical procedures such as intravenous infusions and lumbar punctures are carried out. For example, during November and December 1957, 761 children received intravenous therapy for diarrhoeal disorders at the Out-Patient Department. Most epileptic children are investigated entirely by the staff of the Out-Patient Department.

MAJOR PROBLEMS

The lower the standard of living of a community, the less its protection against noxious environmental influences. Poor housing and sanitation, low standards of personal hygiene, illiteracy and ignorance of food values contribute to the prevalence of preventable disease. In common with most other parts of Africa preventable diseases are responsible for a high morbidity and mortality rate in African children on the Witwatersrand. Although tropical diseases are not endemic in this area, the infantile mortality of the Bantu population in 1956 was nearly 150 per 1,000 live births and this was largely due to diseases such as malnutrition, gastroenteritis and tuberculosis which are no longer problems of significance in European communities.

TABLE I: ADMISSIONS TO THE PAEDIATRIC WARDS IN 1956

Diarrhoeal disorders	1,413
Deficiency diseases	711
Respiratory tract diseases	704
Perinatal problems	704
Tuberculosis (all types)	200
Diseases of the Central Nervous System	198
Blood dyscrasias	195
Genito-urinary tract diseases	66
Gastro-intestinal diseases (except diarrhoeal disorders)	61
Poisoning	57
Rheumatic diseases and chorea	56
Skin diseases (excluding those admitted to the dermatological ward)	27
Malignant tumours (excluding leukaemia)	8
Surgical conditions	642
Total	5,05[illegible]

Table 1 shows the patients admitted during 1956 classified according to the main disease groups. This classification does not take into account that many children suffered from multiple concurrent complaints such as diarrhoea and malnutrition or broncho-pneumonia and rickets. Therefore, the table considerably understates the volume of pathology treated in the Unit. The various groups of diseases will now be discussed in greater detail, with the emphasis on unusual or unexplained features.

ACUTE DIARRHOEAL DISORDERS

More than 1,000 African children die of diarrhoeal disorders in Johannesburg every year. Two-thirds of these fatalities occur during the summer months.[4] Out-Patient Departments and clinics attending to Africans are crowded from about October until March with children suffering from diarrhoea. Only the severest cases can be admitted to hospital, i.e. those suffering from marked dehydration. Of the severe cases 72% are under 1 year old, about 50% suffer from infection with Shigella or Salmonella organisms and more than half are severely marasmic or malnourished. On the other hand, severe attacks of diarrhoea necessitating admission to hospital, are uncommon in fully breast-fed infants or in children over 2 years of age. Of the tens of thousands of children who contracted diarrhoea

the Johannesburg area in 1956, 1,400 were admitted to Baragwanath Hospital. A further 1,000 patients with severe diarrhoea and dehydration who could not be admitted to the wards because of lack of accommodation were treated with intravenous fluids at our Out-Patient Department. During the height of the summer season up to 30 children received intravenous drip therapy daily at the Out-Patient Department (Fig. 1).

The large number of patients requiring intravenous therapy with electrolye solution has necessitated some standardization of procedures. Experience has shown that over 90% of these children are hyponatraemic and usually hypokalaemic as well and they require 100 to 120 ml. of intravenous fluid per lb. body weight per day. In the light of this knowledge we usually succeed with the following type of therapy, even if the serum electrolyte levels are unknown, as is the case in patients treated at the Out-Patient Department. Each child receives a standard electrolyte solution containing 0.2% sodium chloride in 5% of invert sugar. To each bottle of 1,000 ml. of this solution 2 g. of potassium chloride are added unless there are specific contra-indications. A total of 100–120 ml. per lb. of body weight of this solution is administered during the first 24 hours. Where the patient is acidotic, he is given an initial infusion of 1/6 molar sodium lactate solution in quantities of up to 30 ml. per lb. of body weight. This is usually given relatively rapidly over a period of 2–3 hours. The balance of the fluid requirements is given in the form of the standard electrolyte solution.

With this regimen vomiting usually stops within a few hours and in most cases oral feed-

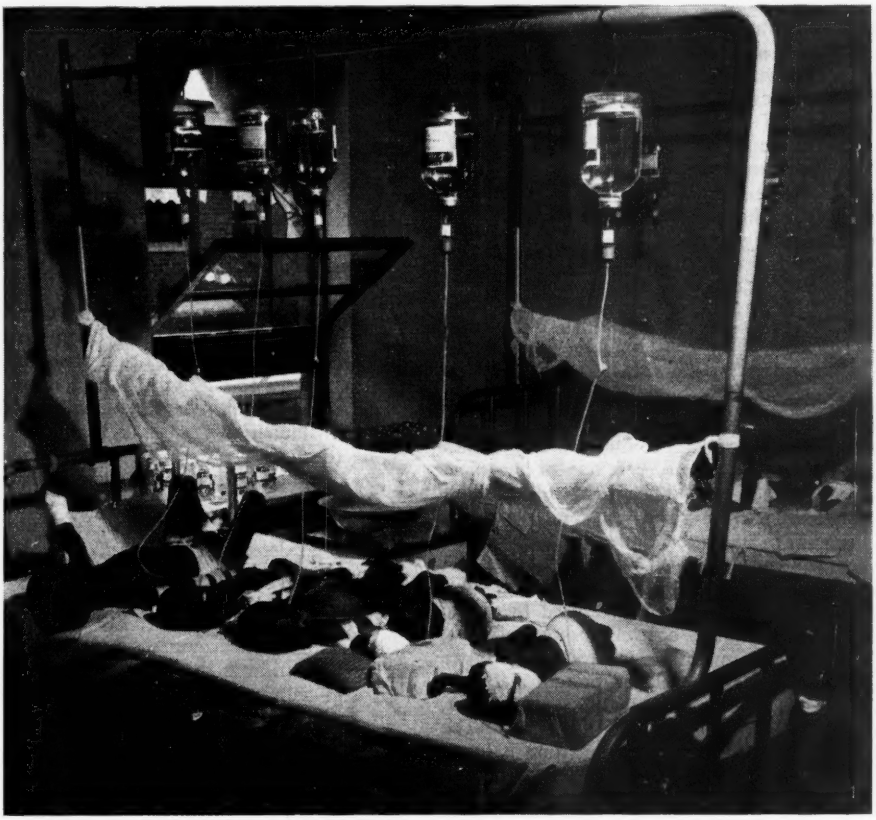

Fig. 1. Dehydrated children receiving intravenous fluids at the Out-Patient Department. Infusions are usually given into scalp and arm veins.

ing is resumed within 12 hours. Feeds consist initially of Altmann's formula* or of unsweetened half-cream milk in quantities of 1 to 2 oz. per lb. of body weight per day. Feeds are increased to 3–3½ oz. per lb. of body weight per day during the ensuing 2–3 days, while intravenous therapy is reduced proportionately. The intravenous drip is stopped when full feeds are taken without difficulty. It should be noted that feeds are not adjusted according to the colour or consistency of the stools, a practice in vogue in former years.

Chloromycetin palmitate is the drug of choice for the treatment of diarrhoea, whether it be due to Shigella or Salmonella organisms, or to pathogens of undetermined type.[5] The drug is given in quantities of 50–80 mg. per kg. body weight for a period of 7–10 days. We do not use soluble sulphonamides in the treatment of diarrhoea, because dehydration may supervene at any stage of the illness and the reduced urinary output may precipitate acute renal failure from sulphonamide intoxication.

During the winter, diarrhoea has been shown to be caused mainly by parenteral infection,[4] usually of the upper respiratory tract. Most of these cases are mild and in these penicillin appears to be the drug of choice. In winter, diarrhoea is rarely caused by Shigella or Salmonella organisms.

NUTRITIONAL DISORDERS

Protein Malnutrition. More than 500 African children with severe protein malnutrition are admitted to Baragwanath Hospital every year. Since for every patient with severe protein malnutrition there are many with milder manifestations of the complaint, it becomes obvious that this disorder is one of the most important causes of ill-health in childhood in this part of Africa. The signs and symptoms of protein malnutrition caused by a maize diet were described some 30 years ago under the name kwashiorkor. On the Witwatersrand advanced protein malnutrition caused by maize shows all the features of kwashiorkor, including the specific dermatosis. Occasionally we see patients who have developed protein malnutrition from a diet consisting of oats or wheat, and in these dermatosis does not occur. The age incidence of protein malnutrition is lower than is described in other parts of Africa, 6% of patients being under 6 months of age, 26% between the ages of 6 months and 1 year, 36% between 1 year and 18 months, 15% 18 months to 2 years, 11% between 2 and 3 years and the remaining 6% are over 3 years of age. Thus the highest incidence of this disorder is between 6 months and 2 years.

Some 10 years ago Altmann pointed out that protein malnutrition, or, as he called it, malignant malnutrition or kwashiorkor, could be cured by the acidified skimmed milk without the addition of vitamins of the B group. He expressed the view that kwashiorkor was a protein deficiency syndrome, and this is now universally accepted.

The usual diet causing protein malnutrition in the Johannesburg area is one consisting mainly or entirely of maize. Small additions of milk to maize do not prevent protein malnutrition. This was shown most conclusively some years ago, when many patients developed this disease in South Africa while consuming a proprietary infant food containing among other ingredients 52% maize and 22% of dried skimmed milk, the latter having a protein content of over 30%.

In small infants breast milk is the best protection against protein malnutrition and it is our practice to recommend prolonged breast feeding, especially in the lowest income groups until the child is 2 years of age. Unfortunately, this is often impossible because the mother has to return to work to support the rest of the family.

There is no evidence that the state of nutrition of the mother in our population has any influence on the state of nutrition of the infant at birth, at least as far as this can be measured by the serum albumin level.[6] Uncomplicated protein malnutrition has never been observed among the fully breast-fed of the half million children who have attended our Out-Patient Department, and Walker has shown that the milk of poorly nourished women from this hospital has no detectable abnormalities.

However, protein malnutrition may occur in fully breast-fed infants who are suffering from some debilitating illness—so-called secondary malnutrition. The common causes of secondary malnutrition at this Hospital are tuberculosis and Salmonella infection of the bowel. This is illustrated by the following case:

A fully breast-fed child aged 6 months was admitted to this Hospital with wasting, oedema of hands and feet, puffiness of the eyes and hyperkeratosis on elbows and knees. There was generalized depigmentation of the skin (Fig. 2). The child thus had the typical clinical stigmata of protein malnutrition. The breast milk of the mother was examined by Dr. A. R. P. Walker of the South African Insti-

* This formula consists of 2 oz. of dried skimmed milk, 1 pint of water, 1 oz. of sugar and 1 drachm of lactic acid B.P.

tute for Medical Research and found to be normal in protein and vitamin content. The child had a positive Mantoux reaction and X-ray of the chest (Fig. 3) revealed advanced tuberculosis involving both lungs, with a spontaneous pneumothorax on the left side. The child died 19 days after arrival in hospital. Post-mortem examination confirmed the diagnosis of advanced pulmonary tuberculosis.

Since we have never seen protein malnutrition in breast-fed children, except in the presence of secondary disease, we are inclined to believe that authors who claim to have witnessed this course of events, have overlooked some other disabling factor. It is occasionally very difficult to detect the cause of hypoproteinaemia in children, and in one of our cases it was traced only after prolonged search to chronic bleeding from the lower end of the oesophagus caused by a hiatus hernia. Secondary malnutrition should always be suspected if a child develops nutritional oedema or other signs of protein malnutrition while consuming a satisfactory diet, or if the signs of protein malnutrition do not remit on a milk formula such as that recommended by Altmann, or any other milk mixture containing at least 2.4% of milk protein.

Altmann reported that the mortality of protein malnutrition at this Hospital was 40% (30% if the deaths occurring during the first 48 hours were excluded).[2] Since then the mortality has been reduced to 20% (12%–15% if deaths during the first 24 hours are excluded). This improvement is attributed to 3 main factors:

1. Better nursing and the use of polythene tubes for naso-gastric feeding of anorexic children;
2. More effective treatment of associated infections such as tuberculosis and salmonellosis; and
3. Intravenous therapy with electrolyte solutions for children with dehydration, however mild this may be.

Dehydration may occur in the presence of oedema, and is usually associated with hyponatraemia and hypokalaemia. In most cases, electrolyte depletion cannot be corrected by feeding alone, and rapid death occurs unless intravenous therapy is given. Our routine intravenous therapy in these cases is the same as that described under diarrhoeal disorders.

Apart from dehydration and electrolyte depletion, the most common causes of death in primary protein malnutrition are intercurrent pneumonia and hypoglycaemic attacks. The latter are probably caused by glycogen depletion of the fatty liver, and they may kill the patient suddenly, particularly during the first week in hospital.

Marasmus. We encounter extreme wasting mainly in children under 6 months of age, particularly in infants who are weaned on dilute feeds of cow's milk or watery suspensions of

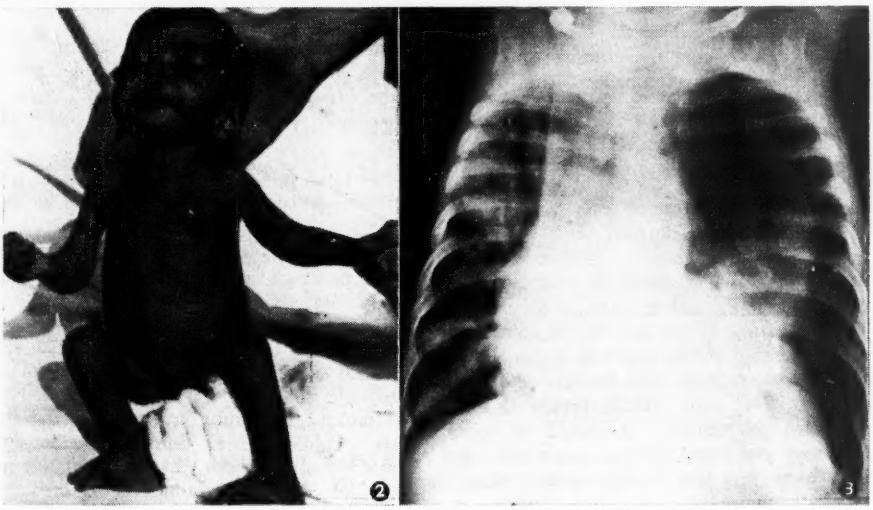

Fig. 2. Fully breast-fed infant with severe tuberculosis and secondary malnutrition. The right eye-lid and the dorsum of the feet are oedematous. There is generalized depigmentation of the skin. Chronic nutritional dermatosis is present on the anterior aspect of the legs. Liver and spleen are markedly enlarged, and a positive Mantoux reaction is visible on the medial aspect of the right forearm.

Fig. 3. Chest X-ray of the patient shown in Fig. 2. There is a spontaneous pneumothorax on the left side and bronchogenic dissemination on the right side.

maize meal or wheat flour. Marasmic infants usually require prolonged hospital treatment and they are a considerable burden to this Unit which admitted 72 such children during 1956.

Pellagra. The characteristic feature of pellagra is a photosensitive dermatosis, whereas the dermatosis of protein malnutrition occurs also on the parts of the body not exposed to sunlight. We have occasionally observed both types of dermatosis together in the same patient. As a rule, we see pellagra in children over 3 years of age, but protein malnutrition in patients under 3 years of age. Nutritional oedema and severe hypoalbuminaemia are rare in patients suffering from pellagra.[7] Because the mortality of pellagra is low, most cases are treated as out-patients. Contrary to textbook descriptions, dementia and diarrhoea are rare in our pellagrous children.

Scurvy. Only 3 children with scurvy have been found at this Hospital during the past 10 years, despite a diligent search for such cases. This is most surprising since the vitamin C intake of the Bantu child is very low indeed and since scurvy is not at all uncommon in adults. Walker has examined the feeds consumed by some of our out-patients and has found them to be almost completely devoid of vitamin C. However, the children taking these feeds had normal ascorbic acid blood levels, and one is therefore forced to the conclusion that Bantu children are able to synthesize vitamin C and that this synthesis probably occurs in the bowel.

Rickets. Despite widespread belief to the contrary, rickets is a common disease among African children under 2 years of age. It was found in varying degrees of severity in 7% of patients admitted to hospital with the diagnosis of bronchopneumonia. Rickets was the primary admission diagnosis in only 24 children during 1956, and in most of these cases the precipitating factor leading to admission was the presence of one of the more dangerous complications, such as gross thoracic deformity or tetany. The latter usually presented with generalized convulsions. It should be noted that tetany and hypocalcaemia are usually regarded to be very rare in deprivational rickets.

Vitamin D resistant rickets has been observed in 12 children during the past 7 years. One of these cases suffered from a malabsorption syndrome. One child suffering from the typical de Toni-Fanconi syndrome presented with gross rickets.

DISEASES OF THE RESPIRATORY TRACT

More than two thirds of the patients suffering from pneumonia are admitted to hospital during the winter, and cases of bronchopneumonia are 7 times as common as cases of lobar pneumonia. The mortality is highest among children with severe rickets and in young infants suffering from whooping cough. The association of whooping cough bronchopneumonia and cor pulmonale is not uncommon and occurred in 6 cases during 1956.

The incidence of bronchiectasis is remarkably low in Bantu children. There were no such cases in 1956, and in the preceding period we have rarely seen more than 4 cases per year. This is all the more surprising, because conditions which may lead to bronchiectasis are very common indeed, e.g. aspiration pneumonia from vomiting, severe attacks of measles and whooping cough and prolonged lobar atelectasis caused by tuberculous hilar glands.

PERINATAL PROBLEMS

In 1956 5,227 infants were born at Baragwanath Hospital and a further 1,763 were admitted to the obstetrics section shortly after birth. In addition to 915 premature infants there were a large number of abnormal deliveries, and paediatric assistance was required for approximately 1,500 patients.

Premature Infants. Infants weighing 5½ lb. or less at birth are relatively more common in the African than in the European population of South Africa. There are 2 main reasons for this:

i. Twin births are twice as common among Africans (1 in 40 deliveries) as among Europeans (1 in 80 deliveries) and twins usually weigh less than singlets.

ii. The weight of infants born to mothers with a sub-optimal state of nutrition is below average.

The prolonged stay in hospital of premature infants and their mothers presented a difficult problem to the Obstetrics Unit, and in 1950 it was therefore decided to open a special ward for such cases under the management of the paediatric staff.

From the beginning it was clear that this Unit would have to differ markedly from similar establishments elsewhere, mainly because of the large numbers of premature infants to be catered for (at least 450 per year) and because of shortage of trained staff and lack of equipment.

The Unit has been described in detail previously.[8] To overcome lack of staff and equipment, children are nursed without incubators

in a ward which is kept at a temperature of 80–85° F. Far-reaching standardization of nursing procedures has enabled us to employ the mothers of the infants for most of the work carried out in the ward.

The advantages of the Unit are as follows:

1. The equipment is simple and cheap. Incubators are not required.
2. A minimum of trained staff is employed, mainly for supervisory duties.
3. Because the mothers carry out nursing duties, the overall ratio of nursing attendants to babies is better than 1:1.
4. The danger of cross infection, particularly from diarrhoeal disorders, is reduced to a minimum, because each mother handles her own baby only, and the majority of infants are not touched by the nurses after the second or third day in hospital.
5. The mother is fully competent to care for her baby on leaving the hospital, because she has already done so continuously during her stay in the ward.
6. The great majority of infants are fully breast fed on discharge from hospital, because the mother's breasts are stimulated by manual expression or breast-feeding at least 10 times a day.
7. The nurses trained in the Unit become familiar with a method of premature infant care which can be applied anywhere in the country, even in a primitive environment.

Of the 915 premature infants who passed through the obstetrics section at Baragwanath Hospital during 1956, only 530 could be admitted to the Premature Baby Unit. Owing to shortage of accommodation, infants weighing more than 4½ lb. were sent home provided they were established on the breast.

The effectiveness of the Unit can be gauged by the data in Table II, which refer to the first 3,000 admissions from May 1951 to December 1957. In this series, there were 297 pairs of twins and 17 sets of triplets. The overall death rate was 44% and two-thirds of the deaths occurred within 48 hours of admission. Nearly all the infants under 2 lb. died. However, 23% of the infants weighing 2–3 lb., 66% of those weighing 3–4 lb. and 85% of those weighing 4–5 lb. survived. The death rate of the infants in the weight group 5–5½ lb. was 11%. This is rather higher than in most other premature baby units; but it should be kept in mind that we admit infants in this weight group only, if either they or their mothers are ill.

On discharge from hospital, 77% of infants were fully breast fed and a further 15% were partially breast fed.

Birth Trauma. During 1956 paediatric assistance was required for 141 infants suffering from birth trauma. The majority of these cases were treated at the obstetrics unit and are therefore not included in the statistics shown in Table 1. Abnormal deliveries are common in this community, and they are due to some extent to the frequent occurrence of contracted pelves in the Bantu women, which is believed to be the result of rickets in early childhood. Of the 141 children suffering from birth trauma, 40 had been delivered by Caesarean section, 40 were delivered by forceps and the remainder were born spontaneously.

Neonatal Jaundice. Nearly 300 infants in the obstetrics unit received attention in 1956 because they were markedly jaundiced. In a series of 200 such cases with serum bilirubin levels between 7.2 and 36 mg. per 100 c.c. there were 4 patients with Rhesus incompatibility and 17 with ABO incompatibility. There were no patients in this group who suffered from jaundice attributable to congenital syphilis. The remaining 179 children were classified as 'physiological' jaundice. However, kernicterus was found at autopsy in 9 premature infants with 'physiological' jaundice, and kernicterus was diagnosed in a further 6 premature infants who survived. It is interesting to note that kernicterus occurred in premature infants at relatively low bilirubin levels, the

TABLE II: MORTALITY AMONG 3,000 PREMATURE INFANTS ADMITTED TO BARAGWANATH HOSPITAL

Weight (Lb.)	1–2	2–3	3–4	4–5	5–5½	*Incomplete Data*	*Total*
Admissions	166	726	1,371	637	71	34*	3,000
Deaths							
First 24 hours	95	281	225	58	4	28	691
24—48 hours	32	74	81	12	2	1	202
48 hours—1 week	22	134	82	21	1	2	262
After 1 week	12	66	81	14	1	—	174
Total Deaths	161	555	469	105	8	31	1,329
Survival Rate	3%	23%	66%	85%	89%	—	56%

* 28 of these infants were moribund on arrival.

lowest levels in this series being 15.1 mg., 15.3 mg. and 16.5 mg. per 100 c.c. respectively. Up to the present, we advise exchange transfusions for premature infants with bilirubin levels of 18 mg. per 100 c.c. or higher. This level may need revision in view of these findings. Owing to the fact that big doses of vitamin K equivalent have been shown to cause hyperbilirubinaemia, we have reduced the dosage of this drug for premature infants to 2.5 mg. for the past 2 years.

Hæmorrhagic Disease of the Newborn. This disease is much more common in Bantu than in European infants and this may be related to nutritional defects in the mother. During 1956 44 infants were admitted to the Paediatric Section with this diagnosis, the highest incidence being during late winter and early spring. This condition was more common in children of mothers who had not attended antenatal clinics and who had, therefore, not received vitamin K prophylactically. Once bleeding has started, vitamin K therapy appears to be of little value, but small blood transfusions usually control the bleeding rapidly.

Congenital Abnormalities. Among the 7,000 newborn infants at Baragwanath Hospital there were 88 with congenital abnormalities, the most common being clubfoot (16), cleft palate and harelip (12), suspected congenital heart disease (8) and mongolism (8).

Sclerema Neonatorum. This condition is now rare in communities with a high standard of living. At this Hospital we see 10 to 20 cases of sclerema neonatorum every year. This disease is probably caused by prolonged and severe hypothermia. Most of our mild cases recover, but the mortality of the severe cases is approximately 75% regardless of the therapy employed.

TUBERCULOSIS

Most aspects of tuberculosis in the urban Bantu child have been discussed in detail by Altmann.[9] It should be realized that our hospital statistics present a wrong picture of the prevalence of this disease in the community, because they refer to the moribund cases, most of the other being treated at municipal clinics.

In our experience, the Bantu child responds to anti-tuberculous treatment as readily as the European child. Unfortunately, infection often occurs at an early age, when complications are common and the mortality is high. Before the advent of isoniazid the majority of patients under one year of age died. To-day recovery is common, except when dissemination to the meninges or miliary spread has occurred.

During 1956, 77 children under the age of 9 years were treated for pulmonary tuberculosis at Baragwanath Hospital. Of these patients 40 were under the age of 2 years and 60% of them died. The mortality among the remaining 37 children was 13.5%. The severity of the illness of these patients can be gauged by the fact that there were 6 patients with cavity formation in the lungs, of whom 4 were under 2 years of age; there were 3 patients with pleural effusions aged 22 months, 4 years and 5 years, and there was one patient with tuberculous empyema. Bronchogenic and miliary dissemination in the same patient, a combination usually regarded as extremely rare, is seen in at least 4 patients every year.

Phlyctenular conjunctivitis was encountered in 36 children (in- and out-patients) during 1956. Contrary to common belief, it is not confined to the early allergic stage of tuberculosis, but occurs at a later stage, even in association with calcifying lesions.

Papulo-necrotic tuberculid is probably the most common manifestation of tuberculous allergy in Bantu children.

Erythema nodosum is also a common manifestation of tuberculous allergy in this community. It is quite often seen in very young children, in whom its distribution differs from that seen in older patients in that the indurated and tender nodes are seen and felt not only over the lower extremities, but also over most other parts of the body, including the shoulders and face.

DISEASES OF THE CENTRAL NERVOUS SYSTEM

Convulsions, stupor, neck rigidity and bulging of the anterior fontanelle are common complaints at the Paediatric Out-Patient Department, where such cases are immediately investigated by lumbar puncture. Patients with a normal cerebrospinal fluid usually continue to attend as out-patients, while those with pleocytosis are admitted to the wards. However, if poliomyelitis is diagnosed, the patient is transferred to the Fever Hospital.

In 1956 there was a fairly extensive epidemic of poliomyelitis on the Witwatersrand, affecting for the first time the European and non-European population with almost equal severity. During the period January–July 1956 we dealt with 119 cases of poliomyelitis. Only 9% of these children contracted the disease in

the non-paralytic form; 79% had evidence of paralysis; 3% suffered from polio-encephalitis and 9% had bulbar involvement.[10]

Leptomeningitis occurred in 99 children during 1956. There were 14 cases of pneumococcal meningitis with 6 deaths, 19 cases of meningococcal meningitis with 6 deaths, 12 cases of influenzal meningitis with 3 deaths, and 4 cases of Salmonella meningitis with 3 deaths. Two children who contracted *E. coli* meningitis died of the disease. In 11 children there was clear evidence of leptomeningitis, but the causative organism could not be isolated. Three of these children died. Most of these patients had received inadequate therapy with antibiotics before arrival in hospital. Of a total of 37 patients with tuberculous meningitis, 21 died.

Fig. 4. 'Home remedy' for influenzal meningitis. Patient's mother shaved the hair over the bulging fontanelle and then incised the skin.

This survey shows that the mortality from the various types of meningitis has remained practically unchanged during the past 3 years,[11] and that it is rather higher than at some other centres. This is attributable to the fact that the patient is often brought to hospital late in the course of the disease, because the mother has failed to realize the seriousness of the child's condition. One such case is depicted in Fig. 4. This patient arrived in hospital 3 days after the onset of influenzal meningitis. The mother had noticed that the anterior fontanelle was bulging, and she shaved the skin over it and then made an incision with a razor blade. Fortunately, the cut did not penetrate the dura, and the child recovered in hospital under rather more orthodox treatment.

Encephalitis, other than polio-encephalitis, was diagnosed in 17 patients. Except for one child suffering from post-measles encephalitis, the aetiological agent remained undetermined.

During 1956 we saw 7 patients with the transient parkinsonian encephalopathy described previously from this Hospital in children recovering from protein malnutrition.[12, 13] This condition has now been observed in many other centres where protein malnutrition is prevalent. Its pathogenesis is still obscure. Parkinsonism is said to occur on rare occasions in patients subjected to insulin shock therapy. This stimulated us to investigate a possible link between the encephalopathy and the hypoglycaemic attacks which occur occasionally during the recovery stage from malnutrition. However, such an aetiological connexion appears unlikely in our cases.

Post-diphtheritic polyneuritis was encountered during the year in 7 patients; all except one recovered.

There was one child with myasthenia gravis among our patients during 1956. Two other children with this rare complaint have been described from this Hospital previously.[14]

BLOOD DISORDERS

A mild normochromic anaemia is a fairly constant accompaniment of protein malnutrition and this was described 10 years ago by Altmann and Murray.[15]

Approximately 50 children with megaloblastic anaemia were seen at this Hospital in 1956. Many of these patients suffered from severe protein malnutrition. However, this type of anaemia is by no means characteristic of protein malnutrition and there is no correlation between the severity of the anaemia and the severity of protein malnutrition.

Severe haemolytic anaemia was seen in 5 children. It was of the acquired type and drug intoxication was suspected as a causative factor. Haemolytic anaemia due to fava bean has not been seen at this Hospital. In previous years, isolated examples have been encountered of severe haemolysis in association with typhoid fever.

There were 35 children with 'cachectic' purpura. The purpuric rash is commonly seen along the clavicles, in the groins and around the back of the head. It is usually associated with severe protein malnutrition, but at least half the cases are suffering from advanced tuberculosis and salmonellosis. No constant abnormalities have been observed in relation to any particular portion of the clotting mechanism of these cases.

Onyalai is rare in our patients. No such cases were observed during 1956, and we have

never seen more than 2–3 examples of this disease during any one year.

There were 2 children with lymphoblastic leukaemia in 1956 and we see about 1–3 cases of leukaemia every year. This condition appears to be slightly less common in the Bantu than in European children.

GENITO-URINARY TRACT DISEASE

There were 51 patients with acute glomerulonephritis in our wards during 1956: all recovered. Three of these patients were severely hypertensive and in congestive cardiac failure and 4 had a temporary anuria. Only 1 case of Type II nephritis was seen. This condition is rare in African children, though it appears to be not uncommon in African adults.

DISEASES OF THE GASTRO-INTESTINAL TRACT

Acute diarrhoeal disorders have already been dealt with, but a few other conditions merit discussion.

Severe herpes simplex of the mouth is seen in 12 to 18 children per year who are usually also suffering from severe malnutrition. It is associated with a high pyrexia which sometimes continues for 2 to 3 weeks. The painful mouth makes oral feeding difficult or impossible and most of these patients have to be fed by naso-gastric polythene tube. In several of our cases the virus has been isolated from the lesions in the mouth. If associated with protein malnutrition, the mortality rises to 50% and no antibiotic has been found of value in the treatment. The cases which have come to autopsy have not shown the specific lesions in the liver and the brain described at other centres.

There were 25 cases of infective hepatitis in 1956, illustrating the fact that this condition is not uncommon in African children. Incidentally, 4 members of the paediatric staff have contracted infective hepatitis from patients under their care.

A report of 3 infants with giant cell hepatitis, admitted here in 1955, was published by Isaacson.[16]

No cases of cirrhosis of the liver were seen during the year, thus supporting the view that fatty change of the liver, so commonly found in malnutrition, does not progress to cirrhosis, at least during the first decade of life.

Two cases of veno-occlusive disease of the liver were admitted to our wards in 1956.[17] This syndrome is commonly seen in Jamaica and India, but rarely elsewhere. A total of 6 children with this condition have now been seen at this Hospital. We have not been able to establish the cause of this disease in Johannesburg. In Jamaica senecio is thought to be responsible, and we strongly suspect that this poison caused the disease in our patients.

Pyloric stenosis is extremely rare in Bantu children. Only 3 cases have so far been observed at this hospital.[18]

No case of coeliac disease has been discovered in a Bantu child at this Hospital. This is probably not surprising if one keeps in mind that maize, the staple diet in the Bantu community, contains very little gluten, a sensitivity to which is thought to be the cause of coeliac disease.

POISONS

Paraffin is responsible for the majority of cases of poisoning admitted to this Department. All those admitted to the ward had evidence of pulmonary complications. A number of milder cases were treated at the Out-Patient Department. Poisoning with caustic soda occurred in 5 children of whom 2 subsequently required oesophagogastrostomy for oesophageal stricture. The remainder of the cases in this group suffered from poisoning with potassium permanganate, mushrooms, aspirin, belladonna and carbon monoxide.

RHEUMATIC FEVER AND CHOREA

It is commonly believed that rheumatic diseases are rare in the Bantu child. Unfortunately, this belief is without foundation. In 1956, 42 children under the age of 9 years were admitted to Baragwanath Hospital with a diagnosis of rheumatic fever. Of these, 17 were under 5 years of age, the youngest being 3 years old. Evidence of carditis was found in 37, while the remaining 5 suffered from polyarthritis only. Rheumatic nodules and erythema marginatum were encountered in only 1 patient, while a pericardial friction rub was heard in one other patient.

Sydenham's chorea was diagnosed in 14 patients not included in the above series. All were over 5 years of age. Nine of the children were of Bantu parentage and 5 were Eurafricans. Since the Bantu population outnumbers the Eurafricans by 10 to 1, the incidence of chorea is lower in Bantu children, and this has been observed by us over many years.

NON-RHEUMATIC HEART DISEASE

The incidence of congenital heart disease in the Bantu child probably does not differ from that in the European child. Table III lists 37 children with congenital heart disease who underwent cardiac catheterization at this Hospital during one calendar year. Fallot's tetralogy and ventricular septal defect were the most common abnormalities in this series.

TABLE III: DIAGNOSIS IN 33 CHILDREN WHO UNDERWENT CARDIAC CATHETERIZATION FOR CONGENITAL HEART DISEASE

Diagnosis	*Number of Patients*
Tetralogy of Fallot	7
Ventricular septal defect	7
Patent ductus arteriosus	5
Pulmonary stenosis	4
Pulmonary atresia	3
Transposition of great vessels	3
A.-V. communis	2
Atrial septal defect	1
Primary pulmonary hypertension	1
Total	33

There was only one child with atrial septal defect. It is likely that many more children with this condition escaped detection and were not referred to the cardiac clinic, because the murmur associated with this defect is usually a soft one. Furthermore, cardiac catheterization is usually confined to cases of uncertain diagnosis, and therefore the above series is not a true reflection of the prevalence of congenital heart disease in the population.

The patients with patent ductus arteriosus were operated on with good results, although 3 of them had pulmonary hypertension before operation.

All 4 patients with pulmonary stenosis underwent valvotomy, 3 of these operations were carried out blindly (one through the right ventricle and 2 through the pulmonary artery) while in the 4th the valve was cut under direct vision from the pulmonary artery, the patient receiving hibernation anaesthesia.

During the past 10 years we have seen 7 patients with idiopathic cardiac hypertrophy, and 4 of these have been reported previously.[19] In 2 patients endocardial fibro-elastosis was found *post mortem*. 'Nutritional' heart disease as described by Gillanders,[20] has never been diagnosed in any child under 9 years at this Hospital. We have, however, witnessed the development of severe irreversible cardiac failure of unknown aetiology in one severely malnourished child. This case could not be classed as 'nutritional' heart disease, because the patient did not suffer from cardiac disease on arrival in hospital, but only developed signs of congestive cardiac failure 18 days after admission, when there were already indications of a favourable response to a good diet. Post mortem examination showed hypertrophy and dilatation of both ventricles and a small patch of endocardial thickening in the left ventricle immediately below the aortic valve.

SKIN DISEASES

Most children with skin diseases are treated in the Dermatological Department and are not included in our statistics. However, in 1956 we admitted 3 cases of epidermolysis bullosa, 2 cases of ichthyosis and 1 case of collodion skin (Harlequin syndrome). During the past 7 years we have seen 10 examples of the latter disease, which is usually considered to be of great rarity.

MALIGNANT DISEASES

There were 8 children suffering from malignant tumours in 1956. These included 3 cases of nephroblastoma, 2 of these were children over 3 years of age. Most textbooks state that this disease does not occur over the age of 3 years. There was one admission each of cases of neuroblastoma, teratoma of the buttocks, sarcoma of the femur and endothelioma of the pleura. One child with xeroderma pigmentosum also suffered from epithelioma of the tongue.[21] We have not encountered a single case of Hodgkin's disease during the past 10 years.

DISCUSSION

We have repeatedly referred to hospital statistics of the year 1956, and in order to impart a meaning to these figures, it is necessary to consider the population at risk. During 1956, the Bantu population of the area served by this hospital numbered just over 300,000. The birth rate of this population was 27.04 and the infantile mortality was 142 per 1,000 live births.

Indigent patients from other parts of the Transvaal who are in need of specialist treatment are often transferred to this Hospital by order of a magistrate. Furthemore, patients from rural districts are frequently brought to

this Hospital by relatives living in Johannesburg, and these 'transfers-in' are usually not disclosed to the medical attendants. We have at various times assessed the percentage of our ward patients not usually resident in the area inhabited by the 300,000 people mentioned above, and this usually amounted to 6–10% of the total.

Apart from these reservations, our statistics concerning ward patients present a fairly accurate picture of the prevalence of severe illness in the Bantu children living in this area. Some of the diseases discussed above show a marked predilection for certain age groups; thus severe diarrhoeal disorders and protein malnutrition are found almost exclusively in children under 3 years of age, while pellagra is hardly ever seen in children under 3 years of age. The population at risk for these and a number of other diseases is therefore correspondingly small.

Abundant proof has been furnished that a large proportion of the paediatric problems of the Bantu in this part of Africa is preventable. A detailed discussion of this subject is not possible here, but it may be of interest that at least one preventable disease, namely congenital syphilis, has receded in importance during the past 10 years. On the other hand, poliomyelitis has been shown to be on the increase, though this does not necessarily reflect improvements in sanitation or personal hygiene.

No special reference has been made to paediatric rarities. Suffice it to state that a large variety of these diseases has been encountered during the past 10 years, and we are convinced that most conditions which have been described in other populations also occur in the Bantu, and that they have very much the same distribution. There are, however, a few peculiarities which require emphasis. The rarity of congenital hypertrophic pyloric stenosis, coeliac disease and bronchiectasis has already been mentioned. Appendicitis is seen in only 2–3 children during the year, and they usually present themselves with an appendicular abscess. Diabetes mellitus has never been observed in a child under 9 years, although the disease is quite common in the adult Bantu. Rhesus incompatibility is much less common than in the European, because the incidence of Rhesus negative individuals is relatively low. Not a single case of congenital dislocation of the hip or osteochondritis was seen at this Hospital during the past 4 years. During the same period there were 42 admissions for congenital dislocation of the hip and 30 for osteochondritis to the Transvaal Memorial Hospital for Children, an institution which serves a European population of about the same size as the Bantu population catered for by Baragwanath Hospital.

There are some popular misconceptions regarding the incidence of certain diseases in the Bantu child. Portal cirrhosis is said to be common, infective hepatitis is believed to be rare and mongolian idiocy is said to be practically non-existent. Except for the specific type associated with veno-occlusive disease of the liver, cirrhosis of the liver is no more common in the Bantu child than in the local European child, and we seldom see more than 1 case per year. Infective hepatitis is quite common, but it is difficult to obtain comparative figures for various racial groups, mainly because the majority of these cases are not treated in hospital. The incidence of mongolism has been found to be the same as in the European population. Rickets, once thought to be rare in South Africa in general and in the Bantu population in particular, is now recognized to be very common in the urban Bantu child under 18 months of age.

Apart from a reduced incidence of congenital syphilis and the emergence of poliomyelitis and veno-occlusive disease of the liver, there has been very little change in the disease pattern among the Bantu children during the past 10 years. However, there has been a profound change in the attitude of the Bantu mother towards modern medicine: her faith in the curative service provided by the Provincial authorities is now firmly established, and there is a growing confidence in the preventive health services provided by the Johannesburg Municipality. There is every hope that many of the preventable diseases now prevalent in the Bantu population will recede in importance during the next 2 decades.

Another significant development is the great advance in the standard of paediatric nursing at this hospital. As stated previously, since 1952 our nursing staff has consisted entirely of non-Europeans, some of whom have had continuous service in the Paediatric Department for more than 6 years and who exercise efficient control over the wards under their care. The progress which has been made in this field can be measured objectively by the very complex nursing routine which has been evolved and by the great increase in the number of severely ill patients who pass through our wards. The emergence of an efficient non-European nursing staff is probably the greatest achievement of this Hospital during the first decade of its existence.

OPSOMMING

Die skrywers verstrek 'n oorsig van die voorkoms van ernstige siektes onder die naturellekinders woonagtig in die gebied wat deur die Baragwanath-hospitaal bedien word.

Ernstige diaree-kwale en proteïen-ondervoeding kom byna uitsluitend by kinders onder 3 jaar voor. Daarenteen word pellagra feitlik nooit by kinders in hierdie ouderdomsgroep aangetref nie.

Daar is afdoende bewys dat 'n baie groot gedeelte van die kindergeneeskunde-probleme by naturelle in hierdie deel van Afrika voorkom kan word. Aangebore sifilis het gedurende die afgelope 10 jaar nie so 'n belangrike rol gespeel nie, maar poliomiëlitis het groter afmetings aangeneem.

Die meeste toestande wat by ander bevolkings voorkom, word ook by die naturelle aangetref, en die verspreiding is min of meer dieselfde. 'n Paar buitengewone kenmerke moet egter benadruk word, bv. die seldsaamheid van aangebore hipertrofiese vernouing van die maaguitgang, buikholtekwale en lugpypverwyding. Blindedermontsteking het gedurende die jaar by slegs 2 of 3 kinders voorgekom. Diabetes mellitus is nog nooit aangetref by kinders onder 9 jaar nie, hoewel die siekte 'n heeltemal gewone verskynsel onder volgroeide naturelle is. Rh-onverenigbaarheid is ook minder algemeen as onder die blanke bevolking weens die klein aantal Rh-negatiewe persone. Nie 'n enkele geval van aangebore ontwrigting van die heup of osteokraakbeenontsteking is gedurende die afgelope 4 jaar teëgekom nie.

Met uitsondering van die spesifieke tipe wat met aar-afsluitingskwale van die lewer geassosieer is, kom sirrose van die lewer nie meer dikwels by naturelle as by plaaslike blanke kinders voor nie (ongeveer 1 geval per jaar). Besmetlike leweronsteking is 'n heeltemal gewone verskynsel, en daar was net soveel gevalle van mongolisme as onder die blanke bevolking. Engelse siekte kom dikwels by stedelike naturellekinders onder die ouderdom van 18 maande voor.

Daar was 'n ingrypende verandering in die houding van die Bantoe-moeder teenoor die moderne geneeskunde. Haar geloof in die genesende diens wat deur die provinsiale owerheid verskaf word, is stewig gevestig, en daar is 'n steeds toenemende vertroue in die waarde van preventiewe gesondheidsmaatreëls.

Die gehalte van die pediatriese verpleegwerk by die Baragwanath-hospitaal het ook verbeter. Sedert 1952 bestaan die verpleegpersoneel geheel en al uit nie-blankes. Die verskyning van 'n doeltreffende nie-blanke verpleegpersoneel kan waarskynlik as die grootste prestasie van hierdie hospitaal gedurende die eerste 10 jaar van sy bestaan beskou word.

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HYPERTONIC DEHYDRATION IN INFANTS

THE CLINICAL AND BIOCHEMICAL FEATURES

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Annually over 1,000 cases of summer diarrhoea are admitted to the paediatric wards of Baragwanath Hospital. The vast majority are severely dehydrated (poor skin turgor) and many are acidotic and hypotonic. In most cases serum electrolyte levels reveal the existence of hyponatraemia and hypopotassaemia. Furthermore, poor nutritional status is present in about 85% of the cases.[1] This description constitutes what we have come to regard as a typical picture of summer diarrhoea.

During the summer of 1957 we observed a group of patients, admitted with gastro-enteritis, who presented a different clinical picture

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which, in recent years, has been described by several American authors variously as hyperosmolarity, hyperelectrolytaemia, hypertonic dehydration or hypernatraemia.[2-5]

The purpose of the present paper is to draw attention to this condition among cases of summer diarrhoea.

MATERIAL AND METHODS

During November 1957 we carefully evaluated all cases of gastro-enteritis admitted to one of the paediatric wards. We found a group of patients who showed marked acidotic type of respiration in the presence of normal or slightly impaired skin turgor. Serum electrolytes, blood urea and serum salicylate estimations were done on admission, and during and after therapy. Serum sodium and potassium were determined by means of a flame photometer. Carbon dioxide combining power was determined by the method of Van Slyke[6] and blood chlorides by the method of Schales and Schales.[7] Blood urea was estimated by the urease method. In addition, where possible, specimens of urine were examined for albumin. The specific gravity was measured and a microscopic examination was performed.

The degree of total dehydration was determined in retrospect by weighing the patient on admission, during therapy and on discharge. At Baragwanath Hospital the mean serum sodium of normal controls was found to be 136.3 mEq. per litre.[8] The upper limit of chloride is considered to be 106 mEq. per litre.

RESULTS

Among 60 children with dehydration and/or acidosis, admitted to one of the wards, there were 5 showing the typical clinical picture of hypertonic dehydration.

The essential clinical and biochemical data are shown in Table 1.

The age incidence ranged from 4 to 10 months. Of the 5 cases 4 were males. Their nutritional state was satisfactory. The percentage dehydration was from 7–14%. Hyperpnoea was invariably present. All the cases were pyrexial, with temperatures above 102.6°F. Skin turgor was normal or slightly impaired in 4 of the cases, only one case being markedly dehydrated. The children suffered from a variety of neurological manifestations (Table 1).

Sodium values ranged from 146 mEq. per litre to 156 mEq. per litre. The chloride levels, with the exception of one case, were all above 114 mEq. per litre. The potassium levels fell within the normal range. The carbon-dioxide combining power was markedly reduced and the blood urea was above 150 mg. per 100 c.c. in 3 of the 5 cases.

TABLE 1: CLINICAL AND BIOCHEMICAL DETAILS OF 5 CHILDREN SUFFERING FROM HYPERTONIC DEHYDRATION

Case No.	Age (Months)	Sex	Weight on Admission (1)	Weight on Discharge (2)	Degree of Dehydration $\frac{(2)-(1)}{(2)}$ Expressed as Per Cent	Hyperpnoea	Maximum Temperature (°F)	Skin Turgor	Neurological Signs	Blood Electrolytes (m Eq. Litre) Na	Cl	K	HCO_3	Blood Urea (mg. per 100 c.c.)	
1	4	Male	10 lb. 12 oz.	11 lb. 9 oz.	7	Present	103°	Slightly impaired	Irritability High pitched cry	156 132	142 100	4·8 3·6	6·7 16·2	74 13	† 0
2	10	Female	22 lb. 3 oz.	24 lb. 1 oz.	7·7	Present	106°	Normal doughy feel	Semi-comatose hypotonic Convulsions	149 137	128 108	4·7 4·7	5·3 12·1	170 41	† 0
3	4	Male	12 lb. 14 oz.	14 lb.	9	Present	103°	Poor	None	146 137	110 101	4·4 3·5	5·9 21·9	280 32	† 0
4	4	Male	11 lb. 14 oz.	10 lb. 3 oz.‡‡	14	Present	102·6°	Normal	Irritable Increased muscle tone Tetany	153 134 155	121 98 124	5·0 4·6 4·7	11·6 16·0 7·5	160 18 105	† 0 *
5	5	Male	12 lb. 7 oz.	13 lb. 12 oz.	10	Present	105°	Normal	Convulsions	149 134	114 106	5·0 5·4	9·5 21·7	106 14	† 0

‡ Weight during a relapse. This patient died and never regained his admission weight.
† = Before treatment.
0 = After treatment.

CASE REPORT

A. M., aged 10 months, was admitted with a 48-hour history of diarrhoea and vomiting. The infant had not been given any fluids for 10 hours before admission and had received a quarter of an A.P.C. tablet the night before. No sulphonamides had been administered.

Physical examination revealed a semi-comatose and hypotonic infant. Her eyelids were half-closed and the eyes were turned upwards. The temperature was 106°F. Respiration was markedly acidotic. The skin had a doughy feel and was dry and hot. The hands and feet were cool. Serum electrolyte levels are shown in Table 1 (Case 2).

Initially the patient was given an intravenous infusion of 0.2% sodium chloride in 5% invert sugar. She also received Chloromycetin palmitate 125 mg. 4-hourly. During the first 24 hours the child received a total of 1,400 c.c. intravenously and 200 c.c. of a 5% sugar solution by mouth.

After 24 hours of complete anuria, the child began to pass urine and became fully conscious. Shortly after the onset of diuresis she began to twitch in both upper and lower limbs. She again lapsed into unconsciousness. At this stage the serum sodium had fallen to 119 mEq. per litre and it was suspected that these fits were due to hyponatraemia. She was therefore given 450 c.c. of N/2 sodium chloride in 2.5% dextrose with 1 g. of potassium chloride. Intravenous treatment was continued with 0.2% saline in 5% invert sugar.

On the second day after admission she was again fully conscious, passing urine freely and taking oral feeds. Respiration was normal. The first specimen of urine passed showed a moderate amount of protein, but no casts or cells microscopically. There were no sulphonamide crystals.

On the third day the hydration was good and the intravenous drip was discontinued. The patient was discharged on the sixth day after admission. She was seen 6 days later as an out-patient, when she was clinically normal and the serum electrolytes were within normal limits.

DISCUSSION

A fairly constant clinical pattern emerged from the study of these 5 cases. In addition to the hyperpnoea and minimal signs of dehydration, the most constant features were: a high temperature, neurological disturbances ranging from irritability, stupor and fits to deep coma; marked oliguria and even anuria.

If these clinical features are encountered in a child it is not wise to commence intravenous therapy with 1/6 molar lactate or other solutions containing sodium chloride in concentrations in excess of N/4 saline.

The condition must be distinguished from pneumonia, salicylate poisoning, encephalitis, meningitis and renal tubular necrosis.

North American authors have found that 10–25% of admissions with gastro-enteritis have hypertonic dehydration.[9] At Baragwanath Hospital the exact incidence of this form of dehydration is unknown, but it is almost certainly higher than previously suspected.

SUMMARY

1. Five cases of hypertonic dehydration in infants are presented.
2. The clinical features are described.
3. The biochemical changes are listed.
4. One case is described in detail.

OPSOMMING

1. Vyf gevalle van hipertoniese dehidrering by suigelinge word bespreek.
2. Die kliniese kenmerke word beskryf.
3. Die biochemiese veranderings word aangedui.
4. Een geval word breedvoerig behandel.

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‡ Weight during a relapse. This patient died and never regained his admission weight.
† = Before treatment.
○ = After treatment.

MORBID LABORATORY SERVICES AT BARAGWANATH HOSPITAL 1948-1957

When the Hospital was first opened, all histopathological material was sent to the central laboratories of the South African Institute for Medical Research and necropsies were performed by the clinical staff. In 1950 the first morbid anatomist (Dr. J. Higginson) was appointed by the South African Institute for Medical Research with specific responsibilities to the hospital. He attended daily to perform necropsies but, in the absence of a laboratory in the hospital, the microscopic examination of pathological material had still to be carried out at the Institute. Due, moreover, to the general shortage of pathologists, he was also responsible for additional routine pathological work from other hospitals. With increasing work the geographical separation between morbid laboratory and hospital became increasingly unsatisfactory and, in February 1954, the present laboratory was opened. The building was regarded as a temporary site and it is intended to place the laboratory finally in the former clinical laboratory building. Now that the new clinical laboratories have been completed, this move will take place in 1958. The siting of the temporary laboratory in the hospital, however, made possible not only improvement in the standard of necropsy reporting but also increased liaison with the clinical staff. It was soon realized, moreover, that the routine examinations carried out at the laboratory would provide a unique source of pathological material. Accordingly, from the first, research studies among the Bantu have been of considerable importance in the development of the Department.

Present Position. To-day the morbid laboratory is staffed by a part-time specialist pathologist and 2 junior pathological trainees. In 1956 a total of 590 necropsies and over 2,000 surgical biopsy specimens were examined in the laboratory. The work of the laboratory is continually increasing but, as in other histopathological laboratories in South Africa, development is limited by lack of trained professional staff. It is hoped, however, that when further staff is available the laboratory will be able to play a greater part in the general organization of the hospital. Priority will be given to the development of clinico-pathological conferences, which are now regarded as a basic requirement of modern British and American teaching hospitals. A preliminary step in this direction has already been taken by Dr. I. Simson in co-operation with the Paediatric Department. Further, there is a large amount of pathological material available, especially in neonates, which also requires urgent study.

This paper summarizes research work which has been carried out in this and other laboratories in this country and clearly emphasizes the important part that pathology can play in medicine in Southern Africa.

GEOGRAPHICAL PATHOLOGY OR GEOMEDICINE IN SOUTH AFRICA

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The importance of environment in the pathogenesis of human disease has long been an accepted medical tenet. When the pathology of disease was ascribed to malignant intervention by the gods, the priests and medicine men of primitive societies often equated environment with the malignant influence of various local deities or devils. The introduction of the experimental method into medicine by Harvey and his successors in the seventeenth century opened a new era in medicine and the whole paraphernalia of medieval medicine, its hypotheses, philosophies and dogmatism gradually fell into dispute. In the following 2 centuries, however, the development of medicine as a science proceeded slowly, and while the clinical features of many diseases were clarified, little advance was made regarding their aetiology and pathogenesis.

The first text book on geographical pathology was written by Hirsch in the middle of the 19th century.[1] This book was widely read and was later reprinted in English. It was the first serious attempt to discuss the distribution of disease in the world. About the same time Snow's excellent investigation of the Broadstone cholera epidemic demonstrated the value of the epidemiological method. Yet it is probably only fair to give the major credit for the development and use of such studies in public

health and medicine to that most magnificent and impossible of women—Florence Nightingale, whose studies on the health of the British army in England and India were outstanding.[2]

The discovery of micro-organisms by Louis Pasteur, and the development of the germ theory of disease in the late 19th century made possible a satisfactory biological explanation for the observations of the epidemiologist. Thus in the last 70 years many of the great communicable diseases of Man such as tuberculosis, typhoid, malaria, yellow fever, etc. have been controlled or eliminated. The germ theory, however, tended to a belief in a monofactorial pathogenesis of disease and the significance of the human soil or substrate in which a disease developed in either an individual or a community was often ignored. To-day it is believed that disease does not represent the response of an individual to a single stimulus but is rather the end result of a multitude of factors, both exogenous and endogenous in character. Geomedicine or geographical pathology is the science of enumerating and identifying these factors in communities and individuals by utilizing all medical disciplines, and not only pathology and epidemiology.

The Geographical Pathology Method. The methods and possibilities of geographical pathology are well known and have been discussed by many authors.[4–6] The basic investigation of any disease follows a stereotyped pattern which requires the answer to 3 questions.

1. What are the facts about the disease?

(*a*) Is the incidence the same or different in different people?

(*b*) Are the pathology, clinical manifestations, etc. of the disease the same in all areas or do they differ from region to region?

2. What are the characteristics of the population or individuals showing the disease, i.e. their cultural, sociological, nutritional background, etc.?

3. To what extent do these characteristics cause and modify the pathology and incidence of the disease?

The exponents of geographical pathology claim that by having the answers to these questions, the prevention and elimination of many diseases become possible. The triumphs of geomedicine in the past have been with the diseases caused by micro-organisms. It is now believed, with the discovery of relatively unaffected populations, that the so-called 'degenerative' diseases of later life such as cancer, arthritis, coronary thrombosis, etc. are not a necessary accompaniment of old age but that their aetiology and ultimate prevention may be determined. A recent article from Denmark is entitled *Lung Cancer, a Pandemic*,[6] and the high frequency of this type of cancer in specific communities and age groups shows a striking resemblance to the epidemiology of the bacteriological diseases. The value of this branch of medical science has recently been emphasized by the World Health Organization which appointed 2 Study Groups in 1957 to standardize nomenclature on atherosclerosis and cancer. Furthermore, Dr. H. Stewart of Bethesda has presented a blue-print for the development of geographical pathology on heart disease and cancer on a world-wide scale, so that comparable data may be collected in many regions.

In view of the present enthusiasm for this branch of medicine and as several geographical pathology studies have appeared from this country, the present paper briefly reviews the place and future of geographical pathology in South Africa.

The Significance of South Africa in Geographical Pathology. South Africa is in a unique situation to develop geographical pathological studies. Not only is it technically more advanced than other parts of Africa, but it is inhabited by several different population groups varying from highly developed urban communities to the primitive peoples of the Kalahari and South West Africa. Furthermore, advancement is not confined to any one race and it is possible to observe Bantu groups, some of whom are living under tribal conditions very similar to those of several hundred years ago, and others who are now exposed to all the stresses and strains of an industrial revolution. The prospects of carrying out medical research on the effect of environment on Man under these conditions is exciting, and offers prospects of obtaining scientific results of great value in the elimination of those diseases which are most common in a civilized community.

The Union is also fortunate in its well developed medical services, without which it is quite impossible to develop geographical pathology studies. Compared to other parts of Africa and to the rural areas, the medical services in the urban areas of the Union are relatively satisfactory and the existence of well equipped hospitals such as Baragwanath renders research work possible. Adequate clinical study of the patients is the basic fundamental of all geomedicine and without it the pathologist and epidemiologist are helpless.

Review of Geographical Pathology studies in South Africa. In early days knowledge of

the geography of disease was confined to the clinical impressions of explorers and travellers, and isolated missionaries working under conditions which precluded accurate results. However, in the last 50 years some very interesting studies on geographical pathology have been made by South African workers, some at this Hospital. In the following section an outline of a few selected investigations is given which have proved suitable for exploration in this region. The review is of necessity superficial and does not pretend to be complete. The emphasis has been primarily on the pathological aspects.

A. THE PROBLEMS OF NUTRITION

The search for food has always dominated man's struggle for existence and the features of undernutrition or starvation were known to the earliest medical workers. It later became clear, with the discovery of the vitamins and trace elements and as knowledge of various foodstuffs increased, that satisfactory nutrition is much more than merely filling the stomach. It is also believed, for example, by many scientists that certain diseases in the Bantu, especially in infants, may be the result of dietary imbalance.[7, 8] Moreover, since World War II it has become clear that over-nutrition can probably also be detrimental to health. Furthermore, nutrient requirements may be modified by dietary context.[7] Until recently it was fashionable to pour scorn on the theories of Malthus, yet to-day it is the opinion of many competent scientists that he was only premature in his views and that Man is hovering on the brink of destruction due to massive overpopulation despite all possible increase of food resources. World food production since World War II has not kept pace with the population increase and it is probable that our grandchildren may be lucky if they can average more than 2,000 calories per day.

It is of utmost importance to determine what are the minimum dietary limits which will permit health and not mere existence. Many of the existing food standards are set too high, due to lack of knowledge, but the world of to-morrow will not be able to afford such inaccuracies. There are Bantu families living in Johannesburg to-day on as little as 2,000 calories per man unit per day, yet apart from a few studies by Walker and others we have little knowledge of the extent to which such diets are detrimental, at least in the adult. In the Korean War, American prisoners fared badly on a diet capable of maintaining the Chinese soldier as a fighting unit. Far too little recognition is given to Man's high capacity to adapt in regard to metabolic activitiy and physiological requirements of nutrients. These are fundamental physiological questions to which an answer is essential within the foreseeable future. They are the problems of this generation, not the next.

Many aspects of human nutrition are suitable for study in South Africa where communities existing at all dietary levels are available for investigation and much work has already been done, some of it at this Hospital. The work of the Gillman brothers in South Africa on many aspects of malnutrition is widely known, as is that of Brock, Walker and many others.

Kwashiorkor (Fig. 1). While the presence of malnutrition factors as a cause of ill health in adults is far from clarified, the nutritional origin of kwashiorkor is generally accepted, although the mechanism is still under investigation. In elucidating the pathology and aetiology of this disease, South African workers have played a prominent role. The clinical background of this disease has been carefully investigated at this hospital by the late Mr. A. Altmann and his successor, Dr. E. Kahn. The significance of the fatty liver was demonstrated by the Gillman brothers at the old non-European Hospital.[7] More recently fundamental progress in establishing aetiology was made by the Cape Town workers who have shown the important part played by amino acid deficiency in this disease.[8]

Bantu Siderosis (Fig. 2). In 1929 Strachan[9] drew attention to the heavy deposits of haemosiderin present in the liver, spleen and other viscera of many South African Bantu who were otherwise in good health. The condition is found not only in the Union but also in the Rhodesias and Portuguese East Africa. It is also common in Ghana, but is absent from French West Africa and the East African territories. Studies carried out in South Africa, some at this Hospital, have helped clarify the pathogenesis and pathology of this condition.[7, 10, 11] There is now general agreement that the source of the iron is from the diet, especially certain fermented alcoholic beverages of low pH, prepared in metal containers such as kaffir pots, paraffin cans, etc.[10] Most South African pathologists believe that the condition (except in those cases where cirrhosis is present) can be readily distinguished on pathological grounds from classical haemochromatosis, although this is denied by others. Experience at this hospital shows no support

for the view that these deposits are detrimental to health in the majority of cases and, except when severe hepatic fibrosis or cirrhosis is present, siderosis is not significantly detrimental to health.[12, 13]

B. CANCER

The early attempts to investigate the cancer pattern among the Bantu have recently been reviewed by Oettle.[15] A report from Grahamstown in 1904 drew attention to 4 cases of liver carcinoma in Bantu patients. Later an attempt was made to establish a cancer register in the province of Natal. Unfortunately, medical facilities at that time were too inadequate to permit any conclusion, and in a year only 6 cancers among Bantu patients were registered, clearly indicating widespread under-registration. Later Pirie and Berman drew attention to the fact that the relative frequency of primary carcinoma of the liver among the Bantu races was one of the highest in the world and very much higher than in Europe and North America. Berman published a monograph in 1951 summarizing his knowledge of this cancer and reviewing its geographical pathology.[16]

The opening of Baragwanath Hospital in 1948 radically improved the bed position for non-European patients in Johannesburg and about 700 general beds for a population of nearly half a million were increased to over 2,000. This enabled Western medical facilities to become available to most of the Bantu population and it was believed that a high proportion of Bantu cancer patients in Johannesburg would have the opportunity of attending hospital.

In 1950 the author discussed the frequency of cancer among the Bantu with the late Dr. J. Allen and with his active support a report on the frequency of cancer among Bantu patients at this hospital was published.[17] Although many of the biasing factors influencing the relative ratios presented at that time were unknown, it was possible to demonstrate that many other differences in the cancer pattern probably existed among the Bantu besides a high relative frequency of liver cancer. It is of interest to note that the conclusions drawn in this paper have not been significantly chal-

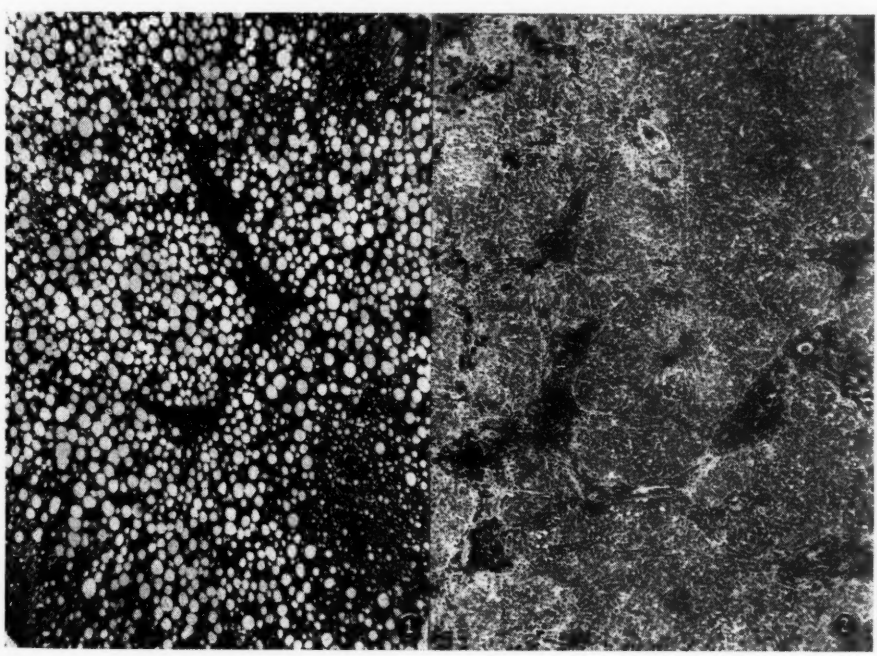

Fig. 1. Typical fatty kwashiorkor liver from a Bantu infant.
Fig. 2. Severe haemosiderin deposits in liver of adult Bantu patient associated with fibrosis.

lenged by the more detailed survey carried out in Johannesburg later.

Encouraged by the success of this early report it was decided, with financial aid from the United States, to do a cancer survey to cover the whole of the Johannesburg magisterial district. This was organized by the pathologist at Baragwanath hospital in conjunction with the Cancer Unit of the South African Institute for Medical Research. The primary object of the survey (1953 to 1955) was to obtain cancer incidence rates in the Bantu and Eurafrican communities in Johannesburg. A very high proportion of cancer was registered from Baragwanath Hospital and the consistent assistance of all members of the clinical staff, as at other Johannesburg hospitals, was greatly appreciated by the Register. The co-operation of other hospitals in the survey region was also greatly facilitated by the efforts and enthusiasm of Dr. Allen. Thus this hospital played a basic part in the first organized cancer incidence survey in a primitive community in any part of the world.

In addition to obtaining cancer statistics, the Cancer Register completed a detailed socio-economic and nutritional study of Alexandra township to permit checking of the sociological data necessary for a survey of this nature. It also provided considerable information about the habits, customs, economic state, etc. of the urban Bantu population of Johannesburg.

The final results of the survey showed that there were considerable differences in the cancer pattern between the Bantu and the White populations of Europe and the Untited States. In males, carcinoma of the liver (Fig. 3), oesophagus, para-nasal sinuses and Kaposi's haemangiosarcoma are more common, whereas tumours of the skin, stomach and large bowel are significantly less common. The leukaemias and lymphomata are approximately half as frequent as in the North American White.

The findings in regard to bronchogenic carcinoma are interesting. The incidence in Bantu males is almost half of that in the White American, but is similar to that in Danish males. Cancer of the lung is the commonest tumour observed in the Eurafrican population, being significantly more frequent than in the United States White or Negro. While cigarette smoking is widespread among the Bantu, they generally smoke only 20-30 cigarettes per week. The Eurafrican is a notoriously heavy smoker and this was also found true for the lung cancer patients in this race. Smoking among females of both racial groups is as yet rare. These results suggest that the relationship of cigarette smoking and lung cancer in the Bantu merits further investigation. Among females, carcinoma of the skin, breast and corpus uteri is significantly less common than in the United States White population, but cancer of the cervix uteri is more frequent.[18]

C. CARDIOVASCULAR DISEASE

i. *Atherosclerosis and Coronary Thrombosis.* In 1946 Becker drew attention to the fact that coronary thrombosis appeared to be very rare among the South African Bantu population.[19] A more recent study of the pathological material available from this Hospital confirmed his observations.[20] The findings of this latter investigation also suggested that although atherosclerosis was as frequent among the Bantu as in White populations, the severer arterial lesions were less common among individuals in the older age groups. Further, the sex preponderance of male coronary deaths, which is a feature of Western Europe and North American peoples, was not apparent in the Bantu.[21] The lack of adequate objective methods to compare degrees of atherosclerosis in different countries was deplored and it is of interest to note that this point is now receiving attention by the World Health Organization.

At present an attempt to solve this problem by clinical analysis has been made in conjunction with Dr. A. R. P. Walker of the South African Institute for Medical Research. The preliminary results of this survey indicate that while total lipids, cholesterol or calcium may permit comparison between White communities, this is by no means true among the Bantu. For example, the increase in calcium with increasing severity of atherosclerosis and with age, as in South African Europeans, is much less marked in the Bantu. It thus appears that qualitative as well as quantitative differences in the pathology of atherosclerosis may exist between the 2 races.

In view of the relationship of the serum cholesterol to atherosclerosis, the serum cholesterol levels of out-patients attending this hospital with conditions unlikely to affect these levels were studied by Arvidsson and Walker and found to be significantly lower than those observed in the United States population.[22] The nature of the relationship of serum cholesterol to atherosclerosis, however, is far from clear and much additional work is still being carried on along these lines, including studies in Johannesburg and Cape Town.

ii. *Idiopathic Heart Disease* (Fig. 4). Gillanders in 1950 reviewed a series of patients

with cardiac failure in this hospital.[23] He demonstrated that failure in these subjects was not due to any of the more common causes usually seen in White races. He further showed that there was considerable evidence that a nutritional factor was involved. In 1951 the pathological findings in 12 such cases were reported.[24]

Since then a larger series of hearts in which the aetiological background was obscured, has been collected. These hearts have come from patients showing varying clinical pictures, but it has not been possible to associate any one clinical picture with a specific pathological pattern. The one pathological feature common to all hearts has been hypertrophy and dilatation. In many hearts intra-luminal thrombi, showing various degrees of organization, have been prominent. Apart from hypertrophy, no lesion has been noted in the myocardium in the majority, although a few have shown varying degrees of myocardial degeneration and fibrosis.

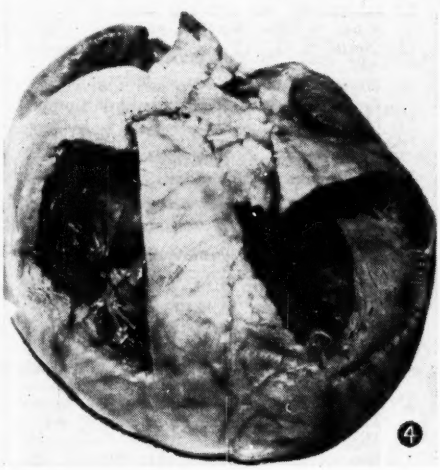

Fig. 3. Primary hepatic carcinoma in a Bantu patient.

Fig. 4. Typical dilated and hypertrophied heart (500 g.) as observed in a Bantu male of 21 years dying of heart failure of unknown aetiology.

A further series of unusual hearts in both White and Bantu subjects has been published by Becker and his co-workers under the title of *Cardiac Collagenosis*.[25] It is probable that there is considerable overlap between the 2 groups and it would appear that while there is generally agreement on the final pathological picture, opinion differs whether the primary pathological lesion is myocardial or endocardial; nor has the significance of nutritional factors finally been decided. It is true, however, that pathologists working in Africa will certainly find many cardiac cases in both ward

and mortuary where aetiology and pathogenesis are obscure. This is an important field for future work.

D. LIVER DISEASE

All clinicians and pathologists working in African hospitals eventually become interested in the high frequency of liver dysfunction. Yet despite numerous publications and much work there is no general agreement even on the pathogenesis of the liver lesions among the Bantu or their significance in health and disease. While there is widespread belief that many of these lesions are the direct result of malnutrition, work at this Hospital has indicated that the role of malnutrition in liver disease, especially in adults, is far from clear among the Bantu.[13]

In reviewing the various liver lesions prevalent at this Hospital it was found that they fell into 2 major groups.

i. A fine portal fibrosis which only occasionally develops into a cirrhosis and is usually associated with severe haemosiderin deposition.

ii. A severe cirrhosis, the histological features of which suggest post-necrotic origin.

It was found that liver cancer almost entirely arises in the latter type of cancer and further that the increase in liver cancer among the Bantu is entirely confined to the hepatocellular type of tumour.[26]

The aetiology of this severe type of cirrhosis is still disputed, but it is my belief that the most probable cause of this type of cirrhosis is a viral hepatitis. A similar opinion has also been expressed by Prof. P. Steiner of Chicago after an extensive study of liver cancer on my part of the continent. Viral hepatitis is by no means uncommon in the Bantu and is seen relatively frequently at all ages. Several cases of neonatal hepatitis have been observed and reported from this Hospital in young infants.[27] The fatty liver so common in Western Europe and North America is almost never seen in the necropsy room in Bantu patients in Johannesburg.[13]

THE FUTURE

Sufficient illustrations have been given to make it clear that there are numerous opportunities available to doctors in South African hospitals to illustrate the pathogenesis and aetiology of diseases of significance not only of the African Negro but also to individuals of all races.

The attack must clearly be made at all levels and will require the co-operation of all medical disciplines. The essential foundation will be built by the clinician who will identify the diseases, follow their course and provide many problems to which the laboratory worker and epidemiologist may bring their specific qualifications.

It is believed that Baragwanath Hospital, as in the past, will continue to be a source of encouragement to all future workers and outline the far future of generations.

OPSOMMING

Die skrywer verstrek 'n oorsig van die navorsingswerk wat in die laboratorium van die Baragwanathhospitaal en in ander sentrums in Suid-Afrika gedoen is.

Hy gee ook 'n oorsig van probleme van voeding, kwaadaardige siektes, kardiovaskulêre kwale en lewerkwale.

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THE PATTERN OF HEART DISEASE IN THE URBANIZED (JOHANNESBURG) AFRICAN

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Some assessment of the pattern of heart disease in the urbanized African of the Johannesburg area may be obtained from the number of cases§ admitted during 1957 to one of the 4 medical units at Baragwanath Hospital (Table 1).

This etiological distribution generally approximates that found among the European population, with 2 notable exceptions, viz.:

(*a*) The virtual absence of myocardial infarction (0.36%).

(*b*) The large percentage of cases (37.5%) where the etiological factors are obscure.

It should be stressed that the relative incidence of chronic rheumatic heart disease in the African is high (20.3%), and comparable with that found in the European.

Another noteworthy feature is the high incidence of hypertensive heart disease (19.6%) particularly in the younger age group (30 to 40 years), with a female dominance (a ratio of 5 : 3).

The reason for the strikingly low incidence of myocardial infarction has not yet been fully elucidated.

TABLE 1: ETIOLOGICAL DISTRIBUTION OF CASES OF HEART DISEASE ADMITTED TO ONE MEDICAL UNIT DURING 1957

Disease Group	*Number of Cases*	*(Males—Females)*	*Percentage of Total*
Tuberculous pericarditis	11	(11 — 0)	4·0
Syphilitic aortitis	3	(0 — 3)	1·1
Acute rheumatic heart disease	9	(3 — 6)	3·3
Chronic rheumatic heart disease	56	(22 — 34)	20·3
Subacute bacterial endocarditis	5	(3 — 2)	1·8
Myocardial infarction	1	(1 — 0)	0·36
Cor pulmonale	30	(24 — 6)	10·9
Cryptogenic heart disease	103	(66 — 37)	37·5
Hypertensive heart disease	54	(21 — 33)	19·6
Congenital heart disease	3	(1 — 2)	1·1

CRYPTOGENIC HEART DISEASE

The major cardiological problem encountered at Baragwanath Hospital is that group with an obscure etiology. A number of varying clinical syndromes has been described whose exact relationship to one another is still speculative. These are:

1. Nutritional heart disease.[1]
2. Cardiovascular collagenosis with parietal endocardial thrombosis.[2]
3. Idiopathic hypertrophy of the heart in african children.[3]
4. Acute reversible heart failure in Africans.[4]
5. Heart failure in the African presenting during late pregnancy, the puerperium and the lactational period.[5]

1. *Nutritional Heart Disease.* This condition[1] shows the following clinical features: congestive cardiac failure with gross oedema, generalized cardiomegaly, gallop rhythm, a hypokinetic circulation and an inert heart on fluoroscopy—a presentation not unlike myxoedema or pericardial effusion.

The diet of these patients was quantitatively and qualitatively deficient, consisting of the usual urbanized African staple diet of highly refined maize, white bread, tea and sugar, with minimal quantities of meat, milk, vegetables and fruit. In all but the most advanced stages of the disease, these patients improved, some

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§ Patients over 10 years of age.

apparently completely, when a well-balanced ward diet, as the sole form of therapy, was substituted for their deficient home diet. Patients maintained in hospital on their deficient home diet, deteriorated. Furthermore, patients who had improved on the ward diet, readily relapsed when their deficient home diet was substituted in hospital. Similarly, relapse occurred when patients returned to their customary home environment and diet. The subsequent clinical course was usually punctuated by several relapses, until finally the condition was refractory to all forms of therapy, including digitalis, mercurial diuretics and thiamine.

At necropsy there was dilatation and hypertrophy of all the chambers of the heart. Antemortem mural thrombi were commonly found in both the ventricles and the atria. Histology demonstrated myocardial hypertrophy and sometimes a fine, patchy, interstitial fibrosis of the ventricular myocardium.

2. *Cardiovascular Collagenosis with Parietal Endocardial Thrombosis.* Becker *et al.*[2] described 40 cases (32 Africans and 8 Europeans) of endocardial thrombosis of the heart that were selected for pathological study from a total of 9,500 autopsies performed during 1936 to 1951. Widespread focal involvement of the connective tissue throughout the body, and particularly in the heart, was demonstrated. Although the histopathological features were similar to those found in the 'diffuse collagen diseases,' they did not show the characteristic lesions of rheumatic fever, periarteritis nodosa, lupus erythematosus or diffuse scleroderma. The clinical presentation of a rapidly progressive heart failure, together with the pathological findings, was sufficiently distinctive to classify this condition as a cardiovascular collagenosis with parietal thrombosis.

While the course of the disease as described by Gillanders is usually subacute, chronic or relapsing in type, acute progressive forms are occasionally seen and appear to be identical with that described by Becker *et al.* Furthermore, there is now a large measure of agreement[6] that the pathological changes in these 2 conditions are probably identical.

3. *Idiopathic Hypertrophy of the Heart in African Children.* Altman and Stein[3] described 4 cases presenting with congestive cardiac failure, cardiac hypertrophy and dilatation for which no obvious cause could be found. Clinically, these cases closely paralleled those described by Gillanders in that they presented with a hypokinetic circulation and a relatively inert heart on fluoroscopy. They differed, however, in their rapidly progressive course and their refractoriness to all forms of therapy. There was no evidence that malnutrition was a causal factor. The pathological features were essentially similar to those found in Gillanders' cases.

4. *Acute Reversible Heart Failure in Africans.* Grusin[4] studied 16 cases of acute heart failure. Thirteen of these (nearly all alcoholics) presented with features of a *hyperkinetic* circulation resembling the classic description of beri-beri heart disease.[7] Of these 13 patients, 10 responded only, and then dramatically, when thiamine was added to the diet; the other 3 responded equally well despite the fact that they were kept on a low level of thiamine. The possible reasons for the unusual behaviour of these latter 3 cases (as postulated by the author) were:

(*a*) Small amounts of thiamine in the so-called thiamine-low diet;

(*b*) Adequate biosynthesis of thiamine by the bacterial flora of the gut whilst needs were reduced by bed rest.

The remaining three cases of heart failure differed in that the circulation was *not* hyperkinetic in type. Two of these patients responded only incompletely to thiamine in that they lost most of their oedema, but the elevated jugular venous pressure and hepatomegaly persisted. A further 2 weeks' bed rest was required before complete remission occurred. The third case did not improve substantially on thiamine or bed rest until digitalis and mercurial diuretics were added. These 3 cases are similar to those of the Gillanders type, with the exception that they did not relapse during a follow-up period of 9–15 months.

5. *Heart Failure in the African Presenting During Late Pregnancy, the Puerperium and the Lactational Period.* In this hospital, one of us (H. C. S.[5]) has observed a form of heart failure in 15 cases which presented during a period ranging from the last month of pregnancy to one year after delivery. The salient features were:

1. The absence of any evidence of preceding cardiovascular disease.
2. Congestive cardiac failure with hypokinetic circulation, generalized cardiomegaly, gallop rhythm and mitral and tricuspid systolic murmurs.

Eight patients recovered completely within a period of one year. Of these, 4 responded to bed rest only (e.g. the case illustrated in Fig. 1). The remainder required the addition of digitalis and mercurial diuretics. Follow-up is still proceeding but, as far as is known, no relapse has occurred despite the return to the home en-

vironment. Of the other 7 cases, 2 pursued a progressive course with a fatal outcome. The remaining 5 are still under observation. They show varying degrees of congestive cardiac failure, persistent cardiomegaly, gallop rhythm and systolic murmurs. This pattern is similar to that described as post-partal heart disease;[8]

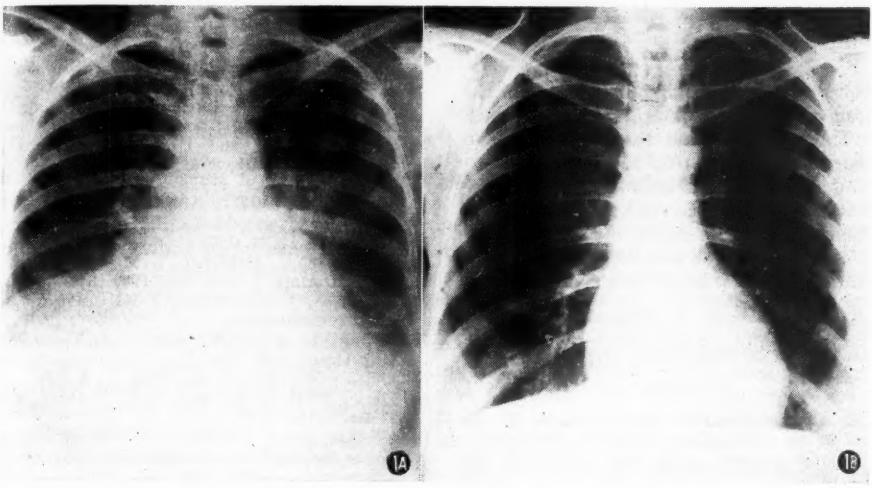

Fig. 1. An example of post-partum heart failure responding to bed rest only.
A: On admission.
B: 13 days later.

post-partum myocardosis;[9] idiopathic myocardial degeneration of the puerperium,[10] by observers in America.

The pathological features in the 2 fatal cases were identical with those found in Gillanders' cases.

DISCUSSION

With the exception of the cases of acute reversible heart failure due to thiamine deficiency, all the aforementioned syndromes have a common clinical presentation, viz., *cardiac failure with a hypokinetic circulatory state*. While a minority of cases run a rapidly progressive course, the majority pursue a subacute, relapsing or chronic course. A fatal outcome is the usual result. The possibility, however, of complete and permanent reversibility suggests itself in some of these cases.[4, 5] The reversibility in some of the post-partum cases may be related to the temporary nature of the metabolic stress during pregnancy, the puerperium and lactation.

The available pathological material[11] shows a basic pattern of myocardial hypertrophy with varying degrees of endocardial and myocardial fibrosis which is seldom marked. Macroscopic plaques of endocardial fibrosis are rarely seen and involvement of the atrioventricular valves never occurs.

Endomyocardial fibrosis associated with cardiac failure, in the absence of any obvious etiological factor, is not uncommon in other parts of Africa.[12-14] Their cases, however, differ from those seen in this hospital in the incidence and extent of the endocardial fibrosis which tends to spread from the apex to involve the mitral and tricuspid valves, resulting in their gross deformity with incompetence (and occasionally stenosis) as the usual result. Furthermore, the outflow tract of the right ventricle may be obliterated.

The etiology of the hypokinetic type of heart failure seen in the Johannesburg African remains obscure. Gillanders postulated malnutrition as the etiological factor based on the response to diet and the concomitant finding of liver disease as determined by liver biopsy which revealed portal fibrosis and siderosis. Contradictory features to this postulate, however, are the usual absence of other stigmata of malnutrition (pellagra, scurvy, rickets, etc.) and the finding of this form of heart failure in children with no evidence of malnutrition.[3] Furthermore, overt forms of pellagra and other types of malnutrition are rarely associated with this clinical syndrome. The liver changes, moreover, are non-specific and have been found in a large percentage of apparently healthy Africans.[15]

The term 'nutritional heart disease' may therefore be a misnomer, and this syndrome should at present rather be designated 'cryptogenic heart disease of the African.' Malnutrition may act in a precipitating or contributory role, as may geographical, climatic and ethnological factors; and it may well be that a multiple etiology eventually produces a common clinical and pathological end result.

SUMMARY

1. The general pattern of heart disease in the African of the Johannesburg area is described.

2. This pattern differs from that found in the European in the virtual absence of myocardial infarction and the high incidence of cardiac failure where the etiology is obscure—'cryptogenic heart disease of the African.'

3. The clinical and pathological features of this obscure form of heart disease are reviewed.

We wish to thank Mr. A. Shevitz of the Photographic Department of the University of the Witwatersrand for the photographic reproductions.

OPSOMMING

1. Die algemene patroon van hartkwaal by die naturel in die streek Johannesburg word beskryf.

2. Hierdie patroon verskil van dié wat by die blanke aangetref word, want daar is 'n feitlike afwesigheid van hartspierinfarkt en 'n hoë voorkoms van hartversaking waar die etiologie duister is—'kriptogeniese hartkwaal by die naturel.'

3. Die kliniese en patologiese kenmerke van hierdie obskure vorm van hartkwaal word in oënskou geneem.

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ON THE INCIDENCE OF SOME BLOOD DISORDERS IN THE SOUTH AFRICAN BANTU

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The current interest in demographic pathology has prompted this presentation of the incidence of some blood diseases as seen in a routine laboratory serving a large non-European hospital. As belief in certain peculiarities in the incidence of some blood diseases in the Bantu, as compared with the European, is prevalent (e.g. extreme rarity of pernicious anaemia,[1] 'hypochromic anaemia,'[2] etc.), such a study appears warranted.

MATERIAL AND DIAGNOSTIC CRITERIA

The patients were all Bantu subjects admitted to Baragwanath Hospital during the 2-year period 1956–57; no Indian or Eurafrican cases are included. As the results of such a study depend, to some extent, on the diagnostic criteria applied, these will be mentioned in detail.

The cases of *agranulocytosis* showed almost complete disappearance of neutrophil leucocytes from the peripheral blood, with a 'maturation arrest' in myelopoeisis, unassociated with anaemia or thrombocytopenia. The marrow returned to normal on recovery.

Christmas disease and *haemophilia* were diagnosed by means of the thromboplastin generation test. Ante-partum haemorrhage in toxaemic patients, with prolonged coagulation time, a prothrombin time of longer than 2 minutes and/or a plasma fibrinogen level of less than 100 mg. per 100 ml., together with

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arrest of haemorrhage following the administration of fibrinogen, warranted inclusion as *afibrinogenaemia* or *hypofibrinogenaemia* of pregnancy. Only cases of *infectious mononucleosis* where the positive Paul-Bunnell test was confirmed by differential absorption tests, are included. The diagnosis of *haemolytic anaemia* was established by the presence of anaemia accompanied by evidence of increased destruction of red cells and compensatory erythropoeisis, often associated with spherocytosis, methaemalbuminaemia, and methaemoglobinuria. In some patients the diagnosis was confirmed by the demonstration of diminished red cell survival time, using radioactive chromium 51. A positive Coombs' test was regarded as evidence of the auto-immune type, and the Donath-Landsteiner test confirmed the diagnosis of paroxysmal cold haemoglobinuria. The presence of Heinz bodies (in the non-splenectomized patient) was taken as evidence of a drug etiology.

'Primary' or 'idiopathic' *iron-deficiency anaemia* was diagnosed by the presence of hypochromic anaemia in patients with no history of excessive bleeding and in whom no source of blood loss could be found, together with various combinations of the following: low serum iron value, absence of stainable iron in the marrow, and response to iron therapy. There was also no evidence of any other disease (e.g. respiratory or cardiac) in these patients. These criteria were satisfied in the adult cases, but in some of the infants marrow puncture was not performed, and serum iron was not estimated. All cases of *megaloblastic anaemia* showed either classical or 'intermediate' megaloblasts in the marrow. In those designated as pernicious anaemia, the diagnosis was established by the demonstration of either defective vitamin B_{12} absorption (using radioactive vitamin B_{12}) corrected by concomitant administration of intrinsic factor, or gastric atrophy. In the other adult cases, the diagnosis of pernicious anaemia was excluded by the presence of normal absorption of radioactive vitamin B_{12}, or the presence of free hydrochloric acid in the stomach.

The criteria for inclusion as *idiopathic thrombocytopenia* were: thrombocytopenia without anaemia (out of proportion to any resultant haemorrhage), normal leucocyte count or leucocytosis, and a marrow containing either a normal or increased number of megakaryocytes; no foreign elements present in the marrow, and no evidence of any secondary disease of the spleen. The acute cases were seen in a single attack of short duration, with no previous history of bleeding. The chronic cases were either seen in at least 2 attacks, or bleeding and thrombocytopenia persisted for longer than 6 months. In all these patients platelets failed to return to normal levels, and the bleeding tendency was constant.

The diagnosis of *marrow hypoplasia* was confirmed on histological section of the marrow, and that of *myeloma* by the presence of classical 'myeloma cells' in the marrow. *Leukaemia* was diagnosed by the usual criteria.

RESULTS

The number of cases of the individual blood diseases are shown in Table 1.

TABLE 1: SOME BLOOD DISEASES SEEN DURING A 2-YEAR PERIOD AT BARAGWANATH HOSPITAL

Disease	*Cases*	*Disease*	*Cases*
Afibrinogenaemia of pregnancy	18	Leukaemia: *Total*	22
Agranulocytosis	3	Acute:	13
Christmas disease	1	Children	6
Haemolytic Anaemia: *Total*	43	Adults	7
Auto-immune	17	Chronic myeloid	4
? Drug-induced	5	Chronic lymphatic	1
Paroxysmal cold haemoglobinuria	2	Monocytic	3
Associated with uraemia, eclampsia or malignant hypertension	9	Erythraemic myelosis	1
Unknown cause	10	Megaloblastic anemia: *Total*	106
Haemophilia	8	In infancy	49
Hypoplasia of Marrow ('Aplastic Anaemia')	5	Adults	57
Infectious mononucleosis	4	Pernicious anaemia	10
Iron-deficiency anaemia	117	Pregnancy	2
In infancy	90	Puerperium	41
'Idiophatic' (adults)	17	'Nutritional'	4
		Myeloma	6
		Idiopathic thrombocytopenia	30
		Acute	21
		Chronic	6
		Unclassified	3

DISCUSSION

The figures in Table 1 represent a conservative estimate of the numbers of individual blood diseases seen, as the diagnostic criteria were strictly applied, and cannot reflect the true incidence of some conditions. Furthermore, haematological investigation was by no means universal among the patients attending the hospital. It must be stressed that this study does not comprise a survey, but indicates the numbers of individual haematological disorders encountered during the routine diagnosis. The figures do, however, provide a basis for discussion.

Afibrinogenaemia and hypofibrinogenaemia of pregnancy are worth recording in the Bantu as this comparatively new arrival on the obstetric scene is an often fatal, yet eminently treatable, condition. The comparative rarity of agranulocytosis and hypoplastic marrow states is a little surprising in view of the activities among the urban Bantu of the ubiquitous witch-doctor and his Native medicines. In only one of the agranulocytics was there a history of drug ingestion, and in one of the marrow hypoplasias. All the cases of agranulocytosis recovered, while all those with hypoplastic marrows were fatal.

Hereditary coagulation defects (haemophilia, Christmas disease, etc.) clearly do occur in the Bantu, but little comment on their incidence is warranted until further cases of bleeding diatheses are investigated by more recent coagulation tests. The 8 haemophilics were seen in 5 families. One disease that does appear to be rare in the Bantu as compared to the European is infectious mononucleosis. The condition admittedly may occur in the absence of a positive Paul-Bunnell test, but the classical blood picture is very rarely seen in our laboratory.

Haemolytic anaemias are undoubtedly very common in the Bantu. This would not appear surprising in view of the exposure to Native medicines. However, almost half the cases seen were of the auto-immune type, while in only one patient was there sufficient evidence (Heinz bodies) to incriminate a drug aetiology. In 3 other patients haemolytic anaemia was associated with abortion and, although drug ingestion was not admitted, it was certainly likely. In many of the haemolytic anaemias no cause could be found; it is possible that with the more frequent use of tests for drug sensitivity, such as the glutathione stability test,[3] a drug aetiology will be established in a greater proportion of cases. Of the 17 patients with auto-immune haemolytic anaemia, 12 were of the idiopathic type, while 5 occurred during the course of typhoid fever. It is necessary to draw attention to this not infrequent complication of typhoid. There were 2 patients with paroxysmal cold haemoglobinuria, of whom one was of the syphilitic type —a somewhat low incidence in view of the prevalence of syphilitic infection among the Bantu population. Severe haemolytic anaemia associated with renal disease, and in pregnancy toxaemia, has been diagnosed with increasing frequency. It is of interest that no case of congenital haemolytic anaemia in the Bantu has been encountered during the period under study.

Statements about the extreme rarity of hypochromic anaemia in the Bantu have long been allowed to pass unchallenged. The evidence (personal communications) for this concept is unfortunately not available for examination. Hypochromic anaemia is not a disease but a sign; the anaemia is either sideropenic or non-sideropenic, the latter form occurring in chronic infections, tuberculosis, etc. and the incidence of this sign obviously depends on the incidence of the underlying causes. The sideropenic or iron deficient form of hypochromic anaemia is likewise not a disease in itself (except perhaps in children) and its incidence depends virtually entirely on the incidence of diseases causing excessive haemorrhage. This form of anaemia we encounter almost daily, particularly in the gynaecological patients. The existence of an idiopathic form of iron deficiency anaemia is to-day generally denied. However, in 17 patients with sideropenic hypochromic anaemia seen over the last 2 years, no cause of bleeding could be found, and they do thus qualify as 'idiopathic iron-deficiency anaemia.' This number can hardly appear small in that in the United States of America there is not a single well-documented published instance in which iron-deficiency anaemia has been shown to develop in an adult in the absence of blood loss.[4]

In Bantu infants iron-deficiency anaemia is extremely common. The condition is almost invariably accompanied by features of malnutrition. Iron-deficiency anaemia is, in our experience, common in the Bantu.

The number of patients with leukaemia is too small to warrant any conclusions. The ratio of acute to chronic forms is certainly unusual. This observation requires further investigation.

Megaloblastic anaemia is common in Bantu infants. In adults, pernicious anaemia certainly occurs and may be considerably more common

than previously thought. The use of more modern methods of investigation (radio-active vitamin B_{12}) has enabled the diagnosis to be established in 10 patients, and it would appear that no conclusions about the incidence of this disease in the Bantu are warranted until further cases of adult megaloblastic anaemia, both in relapse and remission, are investigated by these more modern tests. The commonest form of megaloblastic anaemia in the Bantu has always been regarded as 'nutritional megaloblastic anaemia,' allegedly due to deficient dietary intake of anti-megaloblastic factors. From the figures in Table 1 this is clearly not the case. If the patients with pernicious anaemia are excluded, megaloblastic anaemia in Bantu adults is almost exclusively a condition occurring after pregnancy. That this form of magaloblastic anaemia has any relation to malnutrition remains to be proved.

The picture of idiopathic thrombocytopenia in the Bantu has been very much confused by the continued use of the term *onyalai.* In a consideration of acute idiopathic thrombocytopenia in the Bantu[5] it has been shown that bullae in the mouth are merely an incidental finding, and there is no justification for the retention of the term *onyalai.* The 3 unclassified cases are probably examples of the chronic form, but have not been observed for a sufficiently long period to justify inclusion in that category. It is clear that the ratio of acute to chronic cases (3.5 : 1) is very much higher than in the European (1 : 29).[6] Whether the high incidence of acute idiopathic thrombocytopenia in the Bantu is a reflection of their exposure to thrombocytopenic inducing drugs is open to criticism; in only two of the above patients was there any history of drug ingestion.

SUMMARY

The incidence of some haematological conditions encountered in the Bantu are presented, and the findings discussed.

The thromboplastin generation tests were carried out by Dr. H. B. W. Greig.

OPSOMMING

Die voorkoms van 'n aantal hematologiese toestande wat by die Bantoe aangetref is, word beskryf, en die bevindings word bespreek.

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ALIMENTARY DISEASE IN THE BANTU

A REVIEW

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In the study of the digestive system it is advisable to consider the dietary and other habits of the population. Individuals with personal preferences in food and drink are influenced by socio-economic conditions, by geographical origins and by dictates of custom.

1. *Diet.* Higginson and Oettle[1] state that 52% of the inhabitants of Alexandra Township live below the poverty-datum line. Their diet, while adequate in respect of calories, carbohydrate and total protein, is low in animal protein and fat. Walker and Arvidsson[2] have stressed the high iron content of the diet. However, the population is not homogeneous. Domestic servants often eat as well as their white employers while peri-urban farm labourers may exist on a diet notably deficient in meat, milk and fruit.

The township population is unstable, movement from birth places in the country being partly counteracted by the return of the aged, the incurable or the retired workman.

The regular consumption of *mngomboti* (kaffir beer) is widespread but does not amount to chronic alcoholism. However, numbers of both sexes drink a wide variety of liquors ranging from brandy or gin to *pine-apple* and *Barberton.* Women predominate amongst the severe chronic alcoholics.

2. *Medicines.* Patients frequently use medicines dispensed by the *Nyanga* or medicine-man. Grusin[3] has recorded fatalities due to potassium dichromate taken as an emetic. Cantharides is sometimes administered with disastrous results. Popular purgatives containing phenolphthalein are often responsible for fixed

drug eruptions or erythema multiforme. Enemata are widely used and, if medicated, may cause a severe colitis.

DISEASE PATTERN

The recognition of any syndrome depends to an important degree on awareness of its occurrence in a particular locality. The spectrum and frequency of alimentary disease seen in this hospital is shown in Table 1. Absolute figures are given, since presentation per 1,000 admissions is of limited value in a community where trauma determines so many admissions.

TABLE 1: ADULT ADMISSIONS FOR ALIMENTARY DISEASE (1954 TO 1956)

Condition	*Number per Year*	*Condition*	*Number per Year*
Pellagra	203	Bacillary dysentery	26
Gastro-enteritis	181	Cholecystitis	20
Other avitaminoses	142	Carcinoma of the stomach	19
Amoebiasis	126	Gastric ulcer	14
Appendicitis, acute	122	Cholelithiasis	12
Typhoid fever	96	Trauma of the liver	11
Hepatic cirrhosis	91	Pancreatic disease	10
Tuberculous peritonitis	60	Carcinoma of the pancreas	8
Primary carcinoma of the liver	40	Carcinoma of the rectum	8
Other liver disease	35	Beri-beri	7
Duodenal ulcer	34	Iron deficiency	7
Carcinoma of the oesophagus	32	Acute hepatic necrosis	6
Infective hepatitis	31	Carcinoma of the colon	5
Scurvy	31		

1. NUTRITIONAL DISORDERS

Many cases either do not reach hospital or are treated as out-patients, thus detracting from the value of the figures quoted. Primary malnutrition should be distinguished from that conditioned by rapid growth in children, by pregnancy and by alcoholism.

(*a*) *Vitamin A Deficiency.* I have seen only one example of Bitot's spots in eight years compared with several in six months in Southern Rhodesia. Intake of this vitamin is adequate.

(*b*) *Vitamin B Deficiency.* Grusin[4] believes that Beri-beri is a rare cause of congestive heart failure in this population. Ariboflavinosis is common, both with and without pellagra. The most severely affected pellagrins are usually chronic alcoholics. A study of B_{12} metabolism in pellagra[5] has indicated that there is normal absorption of ^{60}Co B_{12}. Folic acid deficiency manifests itself in the common megaloblastic anaemia of the puerperium.

(*c*) *Scurvy.* This is frequently seen and as Grusin and Kincaid-Smith[6] emphasize, has a pronounced seasonal variation, most cases being seen in Spring. I have seen bleeding into the palate and fauces as well as from the nose.

(*d*) *Iron deficiency* is distinctly uncommon although hypochromic anaemias are sometimes observed.

(*e*) *Protein deficiency* is of uncertain frequency; only 1 to 2 cases of kwashiorkor per year are recognized in the adult.

2. INFECTIONS

Infective hepatitis is commonly seen and follows the expected clinical course. Several members of the White paediatric staff have contracted the illness. This will remain a clinical diagnosis until routine isolation of the virus is possible. Weil's disease does not enter into the differential diagnosis, as it has never been encountered.

Typhoid fever has declined in frequency from 287 cases in adults and children in 1955, to 110 cases in 1956, despite a progressive increase in total admissions over the same period. Studies by Hirsowitz and Cassel[7,8] included the platelet count and sternal marrow cultures. Hirsowitz[9] reported the clinical response to chloramphenicol and Keeley[10] the sensitivity of *Salmonella typhi* to this drug.

Amoeboma must enter the differential diagnosis of a mass in the right iliac fossa, as must hyperplastic caecal tuberculosis.

Amoebiasis is endemic in the townships despite the prevalent idea that cases are necessarily imported from Natal. Shigella of Flexner, *S. sonnei* and the Schmitz bacillus (*S. ambigua*)

are the usual bacterial agents; fortunately Shiga's bacillus is not encountered.

Ascaris infestation is a widespread incidental finding. The mass of worms may, however, cause subacute intestinal obstruction and the tumour may be palpated as it passes onwards. Rarely, the ascaris may invade the common bile duct to produce jaundice. In one such case of mine the worms were found in the hepatic ducts at necropsy. By contrast, ankylostomiasis is rare. Bilharzial infestation of the liver is seen rarely, although rectal mucosal biopsy, especially in the Shangaan population, may yield ova in symptomless subjects. Gummata of the liver or hepar lobatum are, surprisingly, not seen; nor are tuberculomata of the liver, although miliary tubercles or even small tuberculous abscesses may occasionally be detected at necropsy. Hydatid disease is occasionally seen.

3. NEOPLASMS

The total number of cancers of the gastrointestinal tract is similar to that found in a Danish population, but the distribution of the lesions differs strikingly. Oesophageal and liver cancer predominate in the Bantu, whereas stomach and colonic cancer do so in the Danes.[1] Nevertheless, cancer of the stomach not only occurs, but may also present in a bizarre fashion. One patient with haematemesis and gross hepatomegaly was found to have severe thrombocytopenia and metastases in the liver.

The striking clinical features of malignant hepatoma are a short history, often of only 2 weeks, and of a severe spontaneous pain in the right hypochondrium. Most of these neoplasms arise in a cirrhotic liver. In fact, 50% of post-necrotic cirrhotics develop liver cancer.[11] The consistent absence of a history of preceding jaundice does not support the view that the cirrhosis is post-hepatitic. Increased oestrogenic activity has been suggested as a possible carcinogenic factor. The rarity of gynaecomastia in such cases and the failure by Bloomberg *et al.*[12] to demonstrate increased amounts of oestradiol, oestrone and oestriol in the urine, tends to negate the possibility.

'EUROPEAN' DISEASES

Acute Appendicitis. The position of this complaint in Table 1 is noteworthy. Many of the cases have been confirmed histologically. Preconceived ideas of its alleged rarity may result in delay in diagnosis.

Cirrhosis. The fine Laennec or atrophic type is uncommonly seen, the nodular hyperplastic cirrhosis being more usual. The least common form is the septal cirrhosis associated with marked siderosis. The figure of 91 cases is probably an over-estimate, as many diagnoses were made only on clinical grounds. Higginson maintains that it has not yet been satisfactorily shown that the post-mortem incidence of cirrhosis is greater than in the American population.

Peptic Ulcer. The ratio of duodenal to gastric ulcer of 17 : 7 is at variance with the 5 : 6 ratio found at necropsy by Higginson and Simson.[13, 14] Duodenal ulcers tend to present not with the classical dyspepsia but with perforation, penetration, bleeding or stricture formation. This is often due to delay in seeking orthodox medical attention, but may partly be due to failure to consider the diagnosis in the Bantu. The diagnosis is usually made early in Coloured patients. Two cases of duodenal ulceration associated with jejunal ulcers, presumably peptic, have been recorded by Keeley.[15]

Addisonian Anaemia. A personal case (C. K., a 50-year-old Shangaan) diagnosed in November 1950, died 5 years later of carcinoma of the stomach, proven at laparotomy. Subsequently at this hospital, 8 patients with megaloblastic anaemia were shown by Metz *et al.*[16] by means of $^{60}Co\ B_{12}$ absorption tests, to have intrinsic factor deficiency.

Achalasia of the cardia may result in an enormous oesophagus casting a shadow on a straight X-ray of the chest.

In contrast to experience in White communities, only 2 examples of each of *barbiturate* and *salicylate poisoning* were recorded in 3 years.

Caustic soda is frequently used in suicide attempts, especially by Coloureds.

Acute pancreatitis, although frequently sought for is extremely rare. *Ulcerative colitis* is rare, but the radiological picture of a rigid tube may be produced by *chronic amoebic colitis.*

Diverticulosis has been seen once in 2,367 necropsies, of which 789 cases were over 45 years.[14] Palmer[17] gives an incidence of 5% for American adults. *Diverticulitis* has been demonstrated only once clinically and radiologically in recent years. *Hiatus hernia* has been demonstrated radiologically and confirmed at necropsy in a Coloured male. *Steatorrhoea* is extremely rare.

UNEXPLAINED CONDITIONS

Indentation of the tongue margin is frequently observed as an incidental finding. It apparently

bears no relation to frank malnutrition or to oedema of any type.

Inexplicable parotosis similarly is often seen. The relation of *porphyria culanea tarda* to liver disease is at present under investigation by the author.

DIAGNOSIS OF LIVER DISEASE

Liver disease may be investigated at anatomical, histological and biochemical levels.

The differential diagnosis and approximate order of frequency are given in Table 2. Naturally, factors such as the history and the hardness and nodularity of the organ are taken into account.

TABLE 2: DIFFERENTIAL DIAGNOSIS OF CLINICAL HEPATOPATHY

Tender Liver		*Non-Tender Liver*	
Icteric	*Non-Icteric*	*Palpable*	*Non-Palpable*
Infective hepatitis	Amoebiasis	Siderosis	Atrophic cirrhosis
Primary carcinoma	Primary carcinoma	Post-necrotic cirrhosis	Primary carcinoma*
Amoebiasis	Miscellaneous	Primary carcinoma	Amoebiasis*
	Infective hepatitis	Secondary carcinoma	

* Rarely.

1. *Malignant Hepatoma*: Pain and tenderness serve to distinguish this condition from nodular hyperplastic cirrhosis. A point that is insufficiently appreciated is the difficulty that may be experienced clinically in differentiating a carcinoma from an amoebic abscess. I have introduced a Vim-Silverman needle into a hard protuberance only to find 'anchovy sauce' material and, conversely, I have needled a diffusely tender liver which was proved on subsequent needle biopsy to be cancerous.

2. *Amoebic Abscess*: This may be diagnosed with certainty by aspiration of its contents. Despite statements to the contrary, jaundice undoubtedly, albeit uncommonly, does accompany amoebiasis, sometimes sufficiently deep to simulate obstructive jaundice.

Failure to respond to treatment may be associated with multiple abscesses. Rupture into the pericardial sac and even into the inferior vena cava has been observed.

3. *Anicteric 'Hepatitis' Syndrome*: Amoebic hepatitis is a commonly made clinical diagnosis which it is almost impossible to substantiate. In many instances amoebic colitis is not present, and liver biopsy is notoriously unhelpful. It certainly does not demonstrate the amoebae. Therapeutic trial with emetine or chloroquine is open to objection. In the absence of an epidemic of infective hepatitis, the diagnosis of viral hepatitis cannot confidently be made. Liver biopsy may, however, be of value. A case of Hodgkin's disease, treated without response as amoebic hepatitis, was proved at necropsy to have lymphadenoma of the liver and the spleen.

A case of fatty liver in P. C., a male of 35 years, was treated with emetine while awaiting the result of liver biopsy. The tender hepatomegaly subsided. The report unexpectedly revealed a grossly fatty liver. This was confirmed 3 months later at necropsy, after the patient had been readmitted because of lobar pneumonia. In contrast to the child, fatty change is unusual in the Bantu adult.

Radiological. The introduction of 750 to 1,000 c.c. of air into the peritoneum has been used safely and frequently by Keeley,[18] to demonstrate adherence of liver to diaphragm or to distinguish an elevated antero-medial leaf of diaphragm from a localized bulge of liver.

Intracavitary injection of contrast media (instillation of 50 c.c. of air with or without 10 c.c. of Lipiodol into an abscess cavity) has proved useful in defining the size and position of the original cavity, as well as in judging the response to treatment.

Surgical. Needle biopsy should not be relied upon to differentiate between intra- and extrahepatic obstruction. If a diagnosis cannot be made on the history and the clinical findings, laparotomy should be performed. A search should be made especially for a carcinoma of the common hepatic duct when the gall bladder has not been felt pre-operatively.

Histology. This has to be interpreted in the light of knowledge gained from several sources, viz. material examined by Gillman

and Gillman[19] from medico-legal necropsies as well as biopsies from malnourished patients, consecutive necropsies performed at Baragwanath hospital by Higginson *et al.*[20] and a series of needle biopsies analysed by Higginson and Keeley.[21] The frequency of siderosis and portal fibrosis in all these groups emphasizes the danger of postulating a significant association with a particular type of heart disease, as was done by Gillanders,[22] with diabetes mellitus, or with pellagra. Even severe portal fibrosis usually does not disrupt the normal lobular architecture to warrant the term cirrhosis being applied to its modern sense.

Table 3 indicates the findings in a limited series.

TABLE 3: YIELD FROM 178 CONSECUTIVE LIVER BIOPSIES

Histology	*Incidence* %
Siderosis	36·5
Portal fibrosis	19·6
Primary carcinoma	14·0
Cirrhosis	12·9
Normal	12·9
Viral hepatitis	8·4
Miscellaneous*	7·8
Fatty change	3·9
Secondary carcinoma	3·9
† Total	119·7

* Includes centrilobular congestion, interstitial hepatitis, tuberculosis, etc.

† There is overlapping between groups.

Biochemistry. The serum protein pattern, upon which many empirical liver function tests are based, is disturbed in many Bantu subjects. Bersohn *et al.*[23] have shown that babies born with values acceptable as normal by European standards soon develop a hyperglobulinaemia which persists into adult life. Bersohn and Keeley[24] found that the mean values for 88 apparently healthy male hospital employees were:

Total protein	7.61 g. per 100 ml.	(6.3	to 9.1)
Albumin	4.10 g. per 100 ml.	(3.3	to 5.0)
Globulin	3.45 g. per 100 ml.	(2.5	to 5.6)
Gamma globulin	1.50 g. per 100 ml.	(0.84	to 3.4)

Thymol turbidity was greater than 2.0 units in 62.3%; the Takata Ara test was positive in 27.9%. The alkaline phosphatase activity was greater than 13.0 units (13.2–26.6) in 9.3%.

The tests are therefore of limited value in individual patients. Routinely, the estimations of serum bilirubin, urinary bile pigments, serum proteins, alkaline phosphatase, the prothrombin index and its response to parenteral vitamin K, are considered adequate for the investigation of liver function.

Alkaline phosphatase values may be as high as 100 units, even in the absence of jaundice in primary hepatic carcinoma. A normal level, however, does not exclude neoplastic change in a nodular hyperplastic cirrhosis.

Serum iron estimates are of little value in differentiating infective hepatitis from extrahepatic obstructive jaundice in this population. Levels in apparently healthy Bantu have been shown by Gerritsen and Walker[25] to be higher than in White subjects. Further, there is broad agreement between the height of the serum iron and the intensity of iron deposition in the liver as reported by Higginson *et al.*[26] Certainly, levels of up to 400 microgrammes per 100 c.c. may be found in the non-jaundiced patient.

DISCUSSION

The field of alimentary disease is dominated by the problem of siderosis. Does it reduce life expectancy? Does it cause morbidity? Is the iron available for haemoglobin synthesis? Does classical haemochromatosis occur in the Bantu? Siderosis does not appear to be a direct cause of death; siderotic subjects do not die in liver failure, sudden cardio-vascular collapse or in congestive heart failure as do persons with haemochromatosis. Certainly, the idiopathic cardiac hypertrophy seen so frequently in this community is not associated with iron deposition in the mycardium. Siderosis is common in the Bantu female although haemochromatosis is rare in that sex. Diabetes mellitus does not occur with a frequency suggesting that significant pancreatic siderosis occurs. Diabetes mellitus, diminished body hair and testicular atrophy may co-exist with siderosis and even with cirrhosis without the association being significant.

The diagnosis of liver disease in the Bantu demands an appreciation of the background of the patient, mastery of needle biopsy and other techniques as well as caution in the interpretation of histological and biochemical data.

SUMMARY

A review of diseases of the alimentary system, based on personal experience over 8 years at Baragwanath hospital, is presented.

OPSOMMING

'n Oorsig van kwale van die spysverteringskanaal, gegrond op persoonlike ondervinding gedurende 'n tydperk van 8 jaar by die Baragwanath-hospitaal, word verstrek.

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THE WORK OF THE SURGICAL DIVISION

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Limitations of space preclude a comprehensive review of all aspects of the work of the Surgical Division over the last 10 years. The report has therefore been confined to the *Paraplegic Unit* and *Head Injuries.—The Editors.*

I. THE BARAGWANATH PARAPLEGIC UNIT

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In an age when the tendency is towards over-specialization, it is refreshing indeed to refer to a subject which cuts across virtually every known branch of medicine; which calls for the greatest skills and all that is best in nursing; and which mobilizes the full forces of the ancillary medical services. In no group of cases does the rehabilitative aspect loom larger, from the moment of onset of the lesion until the fullest possible degree of physical, social and occupational rehabilitation has been achieved; in no group of patients are lapses on the part of doctor or nurse more costly in terms of patient-suffering or pounds, shillings and pence; and nowhere is the need for the maintenance of morale of patient, nurse and doctor more vital. Above all, the prime requisite of every member of the team concerned in the handling of the paraplegic is service—sustained, dedicated service with no thought of reward other than the restoration of the patient to the fullest possible extent and the satisfaction that stems from this achievement. These facts will explain why satisfactorily functioning paraplegic units in most parts of the world are so few and far between.

In our case the high incidence of trauma, more particularly that resulting from stab wounds, has tended to make a virtue of necessity and the writer takes this opportunity of paying tribute to the devoted services of both the medical and nursing staff and congratulating them on the high standards they have achieved and maintained. At Baragwanath we have endeavoured to mould our Paraplegic Unit on the pioneer unit in this field established at Stoke-Mandeville under Gutt-

* Senior Surgeon.

man. The knowledge gained and the lessons learned in World War II and the post-war period have enormously reduced the 80% mortality rate described by Cushing[1] after the First World War, and we at Baragwanath are endeavouring to apply these precepts to the spinal casualties which occur incessantly amongst the urbanized Africans in and around Johannesburg.

At Baragwanath we admit about 50 new cases of partial and complete lesions to our traumatic paraplegic unit each year, the majority being due to stab wounds inflicted on young adult males in the prime of life. Females are very seldom involved. The number admitted could be multiplied if we were to take in all cases from other centres seeking admission, and had we more accommodation and facilities and a more satisfactory means of disposing of cases once they have become medically and physically rehabilitated. A statistical review and a detailed account of the clinical features of the cases treated in this Unit will appear in a subsequent publication. Other aspects of the Unit will be dealt with here—more especially those concerned with treatment and rehabilitation as well as the pathology of traumatic paraplegia and factors determining prognosis on which rational treatment must be based.

PATHOLOGY

1. *Spinal Cord Lesions.* We have been able to add little to the detailed knowledge of the pathology of the spinal cord lesion, despite the relatively large numbers of paraplegics we handle, because our conservative approach to surgical intervention in these cases offers very little opportunity for observation of the cord lesion at operation, and the low mortality rate yields still less opportunity for post-mortem inspection.

2. *Associated Injuries.* As these paraplegics are in the main victims of assault, associated injuries are not uncommon. Severe head injuries and penetrating wounds of the abdominal and thoracic cavities occasionally mask a lesion of the cord. In one case treated by the writer, in addition to a head injury the patient received a stab from a knife, the blade of which pierced the stomach, spleen and diaphragm and entered the pleural cavity, lacerating the left lung and inflicting severe damage to the spinal cord. After a stormy convalescence following splenectomy and the added complication of an empyema thoracis, the patient was rehabilitated to the extent that he could get about with the aid of crutches and calipers and lead a wheel-chair existence.

3. *Cause of Death.* Urinary sepsis, resulting in renal deficiency, is responsible for about 80% of deaths and severe bed-sores for the remainder.[2]

PROGNOSIS

During the few years that the Baragwanath Paraplegic Unit has been established, the feature that has impressed itself on all concerned is the fact that those cases of total paraplegia which we get shortly after the trauma, before bed sores have shown themselves, are generally fit to be discharged in about 6–9 months; once bed sores are established, this period of hospitalization is doubled or trebled. Moreover, the advent of the bed sore retards every aspect of the healing and rehabilitative process, and confines the patient to bed, to say nothing of the loss of morale which tends to become 'infectious.' We are in accord with Guttman's finding that the vital factor determining the prognosis of traumatic paraplegics is not the level of the lesion, as is commonly taught, but the degree of care and attention to all the details of immediate and early treatment—in particular, the prevention and combat of the two main complications, urinary infection and pressure sores.

TREATMENT AND REHABILITATION

This is based on Guttman's concepts. Our nursing and auxiliary staff consists of an African Nursing Sister, African Staff Nurses and several African orderlies, working under the supervision of the neurosurgeons. The doubts and misgivings concerning the potential of the African nurse in measuring up to the high standards of nursing required in this most exacting branch of medical work have, in the event, been proved beyond all question to be completely unfounded.

In the handling of the paraplegic the following features warrant special mention, viz.:

1. *Bed Sores.* These share with urinary infection the distinction of being the most dreaded complication of the paraplegic and as already indicated they provide *the* example, *par excellence,* of prevention being better than cure.

The prevention, pathology and treatment of bed sores as practised at the Baragwanath unit has already been fully reported on by Matheson and Lipschitz.[3] It is sufficient to stress here the need for highly skilled nursing,

2-hourly turning, scrupulous hygiene and skin care, adequate nutrition, high protein diet and, above all, the maintenance of a high haemoglobin level—a level of at least 15 g. %. It is generally accepted that the presence of sepsis, from whatever source, particularly when associated with anaemia which is always present in cases with untreated or inadequately treated pressure sores, will retard the recovery process of the spinal cord lesion in those cases where some degree of recovery is otherwise possible. Walsh[4] has drawn attention to the increase in protein catabolism and the excessive urinary excretion of protein metabolites. When we are dealing with a population in which the albumin : globulin ratio is already normally inverted, the effects of the additional loss of colossal amounts of protein is disastrous. When the paraplegic develops bed sores, adequate transfusion of blood is of vital importance.

2. *Bladder Management.* The prime objectives in the management of the cord bladder are:

1. Avoidance of infection.
2. Establishment of bladder control.

These objectives are best achieved when the appropriate management is instituted immediately after injury.

The first premise, that of avoidance of infection, is dependent upon strict asepsis during catheterization and instrumentation, a large fluid intake and the use of small calibre catheters, not larger than 16 Fr. in the adult.

The general measures for the management of paraplegics in the maintenance of haemoglobin, electrolyte and nutritional levels and the prevention of bed sores by 2-hourly turning, have a distinct bearing on the rapidity with which effective bladder control is developed.

The management of effective bladder control commences immediately after injury, when the tissues are in a state of diminished tone and are easily subject to pressure necrosis. Gentle catheterization at 8-hourly intervals is the procedure of choice. At a later stage, when spinal shock has passed off and the tissues are better able to withstand pressure, the catheters (Foley type) are left indwelling but changed at 3–5 day intervals, until there is evidence that the bladder shows return of activity. To maintain vesical tone the bladder is filled morning and evening and immediately evacuated. The return of bladder function is manifested in the ability of the patient to empty his bladder by either abdominal muscular contraction or by manual expression, or both. Evidence of the return of bladder control usually takes 1–8 weeks, averaging about 6 weeks.

The assessment of bladder control commences about one week after injury, by noting whether any sensation (normal or abnormal) is experienced when the bladder is full and whether the patient can void by manual expression or abdominal straining. This procedure may require assistance from the medical or nursing staff, by additional manual expression in order to empty the bladder as completely as possible. If successful, the catheter is discarded and a regime of frequent evacuation is continued. In between these times a showercap is provided in case of accidental emptying. If unsuccessful, the catheter is continued as before and the test is repeated after a few days.

Several procedures for assessing vesical function are available,[5] particularly in chronic ill-managed cases or where bladder control is not returning satisfactorily. These include cystometry, cysto-urethrography, cysto-urethroscopy, and electro-myography. All these procedures provide vital evidence of the relation between detrusor activity and the state of the bladder neck or its sphincters. If there is evidence of obstruction at the bladder outlet or spasm of the external sphincter, transurethral resection will be required to correct the former and pudendal nerve section for the latter. Both procedures may be warranted in certain cases, in order to allow adequate evacuation of the bladder.

For the paraplegic, effective bladder control allows less restriction of movement and occupation and greater social acceptability. Portable urinals or modifications require to be worn in case of accidental bladder evacuation when patients return to occupational activity.

3. *Spasms and Contractures.* These, resulting from heightened reflex activity of the isolated cord, can be most incapacitating complications. They may largely be controlled by appropriate physiotherapy. The use of drugs has proved disappointing in the treatment of spasms. In severe cases of spasm not responding to physiotherapy, selective peripheral nerve section or blocking has proved beneficial.

4. *Physiotherapy and Occupational Therapy.* As regards facilities for specialized care and rehabilitation, our well-equipped Physiotherapy and Occupational Therapy Departments, working as an integrated Unit under the guidance of a specialist in physical medicine, play their part as important members of the paraplegic team, with the emphasis on the early institu-

tion of compensatory muscle training. Concurrently, the Occupational Therapy Department is busy teaching these patients a trade.

5. *Ultimate Socio-Economic Rehabilitation.* It is in the final stage—that of providing sheltered employment to round off the rehabilitative process—that we are woefully deficient, because as yet no single government department is legally obliged to satisfy this requirement. However, strenuous and sustained efforts are being made to have this matter set right.

The absence of some form of institution which will afford sheltered employment and domiciliary facilities is a double handicap.

(*a*) It hampers the disposal of a group of patients, medically and physically rehabilitated, yet unfit to compete in the open labour market, because of peculiar problems in relation to locomotion and transportation;

(*b*) It delays the admission of new cases in urgent need of the specialized treatment that is afforded in a Unit where there is limited accommodation. This delayed admission inevitably brings with it the disastrous complications already referred to.

Despite these limitations, we have been happy to accord to an underprivileged section of the community a service as yet denied those generally regarded as being much more fortunate.

SUMMARY

1. The scope and work of the Baragwanath Paraplegic Unit has been reviewed. The importance of early admission to a specialized unit is stressed.

2. The lack of suitable domiciliary and sheltered employment facilities remains the chief handicap once these patients have been brought to that stage where they are fit to be discharged from hospital.

3. Frequent references have been made to the work of Ludwig Guttman. This calls for no apology, for the progress and advance in the field of rehabilitation in relation to the paraplegic is largely the story of Guttman's drive and tenacity and his contribution to this branch of medical science.

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II. HEAD INJURIES

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Neuro-Surgical Staff:

J. BLOCK, M.B., F.R.C.S. (*Neuro-Surgeon*).
R. LIPSCHITZ, M.B., F.R.C.S. (*Neuro-Surgeon*).
A. KESSLER, M.B. DIPLOMA IN SURGERY (*Neuro-Surgical Registrar*).
D. HAGEN, M.B. CH.B. (*Neuro-Surgical Registrar*).

I. JACOBSON, M.B. CH.B. (*Senior House Surgeon*).

General Surgical Staff:

L. STEIN, M.B., F.R.C.S. (*Surgeon*).
R. A. FLEMING, *O.B.E.*, M.B., F.R.C.S. (*Surgeon*).
S. SHER, M.B., F.R.C.S. (*Assistant Surgeon*).
M. DINNER, M.B., F.R.C.S. (*Assistant Surgeon*).
I. OPESKIN, M.B., F.R.C.S. (*Assistant Surgeon*).

To obtain some idea of the volume and type of head injury work this Hospital is called upon to do, and to assess the amount of this work relative to the overall picture of the Surgical Division, an analysis of all head injury cases admitted to a single surgical unit during a complete year (1957) has been presented (Table 1). The total admissions to this unit were 3,520. Of this total 2,500 (71.0%) were traumatic in origin and carried a mortality rate of 2.52%. Of the 63 deaths, the 599 head injuries accounted for no less than 33, a figure which gives a mortality rate of 5.5% for head injury, and accounts for 52.5% of traumatic deaths in the Unit. If the further cases of head injury 'slept over' in casualty and not admitted to the wards because of bed-shortage were included in the series, the mortality rate of head injury could be reduced by at least 50%.

As far as we have been able to judge over the years, the failure to admit the lesser degrees of head injury, including mild concussion, has by and large not resulted in any untoward sequelae. On the contrary, we are strongly of the impression that early return to duty has done much to lessen the incidence of post-traumatic neurasthenia and to eliminate anxiety states encountered so frequently in European patients suffering from similar trauma.

On the other hand, the high proportion of deaths resulting from head injuries relative to the over-all hospital death rate has served to establish a high priority in laying claim for more neurosurgical beds and staff when additional accommodation becomes available under the current hospital expansion programme.

TABLE 1: ANALYSIS OF ALL HEAD CASES ADMITTED TO ONE UNIT IN 1957.

Group	*Bed Letter Diagnosis*	*Number*	*Deaths*
1	Lacerated scalp. Shock. Exposure. No coma	35	
2	Lacerated scalp. Multiple injuries. No coma	13	
3	Lacerated scalp. History of coma	43	
4	Head injury. History of coma	126	
5	Simple fracture of vault. History of coma	54	
6	History of coma. No fracture of the skull. Multiple injuries	85	
7	History of coma. Simple fracture of the skull. Multiple injuries	7	
8	Compound fracture of the skull	76	
9	Compound fracture of the skull. Multiple injuries	4	
10	Compound depressed fracture of the skull. Coma	35	1
11	Fractured base. Coma	27	
12	Compound and simple fractures with cerebral laceration and contusion	78	25
13	Intracranial haematomata (subdural, extradural, cerebral laceration)	16	7
	All types of Head Case admitted to 'K' Unit	599	33

TABLE 2: ANALYSIS OF ALL HEAD INURIES ADMITTED TO A SURGICAL DIVISION IN 1957.

Admissions	*African Males*	*African Females*	*Coloureds*	*Children*	*Total*	*No. of Deaths*	*Mortality Rate*
"K" Unit	489	75	20	15	599	33	5·5%
"S" Unit	518	54	15	19	606	24	4%
"F" Unit	467	79	20	16	582	26	4·5%
Unit 4	279	27	3	7	316	15	4·7%
Total Surgical Division	1,753	235	58	57	2,103	98	4·6%
Percentage Distribution	83·5%	11·2%	2·7%	2·7%	100%		
No. of Deaths	90	7	1	—	98		
Mortality Rate	5%	3%	2%	0%	4·6%		

The figure of 599 head injuries is the number actually treated in a single Unit during the year under review. Analysis of the 599 head injuries treated in the Unit during the year under review is shown in Table 1. The total number of head injury cases treated in the whole surgical division was 2,103 (Table 2). Despite experience gained in the handling of such vast numbers of this type of case, their assessment, treatment and prognosis still present considerable difficulty. It will be noted from Table 1 that virtually all the deaths following head injury are contributed by two categories (12 and 13) which comprise cerebral contusion and laceration and the different varieties of intracranial haematomata. In other words, a relatively small group—15% of the total—produced 97% of the mortality. It is in the handling of this small but extremely dangerous group that the more skilled services of the neurosurgeon are indicated. No less an authority than Norman Dott,[1] who directly and indirectly has done much to influence neurosurgical trends in this Hospital, states:

'I find head injuries much the most difficult of our cases to evaluate, to understand and to treat adequately.'

Extensive compound skull fractures literally oozing pulped brain tissue frequently do amazingly well, provided the brain stem escapes primary or secondary injury. Simple fractures as such are unimportant except in so far as they denote the severity of initial injury.

Because of the clinically ill-defined borderline between the serious and the not-so-serious of the head injury cases, all head injuries should ideally come under the skilled care of the neurosurgeon. Since, however, the enormous numbers of this type of case encountered at this Hospital make this ideal impossible of attainment, we do the next best thing—we refer as many of the more serious cases as possible to the neurosurgeon, and at the same time train the general surgeon, who is called on to treat thousands of such cases, to become as adept as possible in their handling.

Table 3 tells its own tragic tale. The attendance of over 5,000 cases of head injury at a single hospital in a single year must surely be without precedent. Even if we eliminate those cases treated in the Casualty Department and allowed to go home and those 'slept over' in Casualty and discharged the next day because of bed-shortage, the figures are still staggering.

Comparison with other centres may be of interest. At the commencement of the last war, special Head Centres were set up in England by the Emergency Medical Services. 'An idea of the work of these centres can be gained from the Table below which appertains to 6 centres and covers the first two years of the war:

TABLE 3: MONTHLY DISTRIBUTION OF HEAD CASES.

	Cases Passing through Casualty	*Cases Admitted to Wards*
January	526	214
February	429	159
March	343	185
April	424	167
May	392	189
June	408	188
July	357	191
August	481	153
September	502	178
October	352	167
November	338	154
December	472	158
Total (1957)	5,024	2,103

ANALYSIS OF 3045 ADMISSIONS TO 6 NEUROSURGICAL CENTRES

Head injuries	1,509
Brain tumours	393
Brain abscesses	50
Epilepsy	125
Spinal tumours and injuries	219
Peripheral nerve lesions	102
Other conditions	447

By the middle of 1943 the total admissions had risen to 5,638 of which 46.8% were military personnel, the rest civilians.[2]

The validity of the comparison becomes apparent when it is realized that the urbanized African exists under conditions of perpetual civil war. In Great Britain during the war 'the great improvements in the treatment of head injuries were made possible by the segregation into special neurosurgical centres of all patients with such injuries occurring among military personnel or civilians engaged on special work.'[2] At Baragwanath we are attempting to follow a similar course.

ROUTINE TREATMENT

The detailed management of closed head injuries will be dealt with in a subsequent communication. In brief, the aims are:

1. The assessment of whether operative intervention is required.
2. The nursing care of the unconscious patient.
3. Rehabilitation—mental and physical.

However, it is perhaps not out of place to record the current trends at this Hospital.

1. (*a*) A special *Head Injury Chart* is filled in as soon as the patient arrives in hospital. Here are recorded the history and the neurological findings on arrival, special attention being paid to the level of consciousness. The main object of this chart is to establish a *baseline* for the assessment of subsequent progress. This is of vital importance as deterioration of either level of consciousness or increased neurological deficit in association with changes in the temperature, pulse and respiration rates is regarded as the most reliable indication for operative intervention.

(*b*) The routine lumbar puncture of head injury subjects as a diagnostic or therapeutic device has been abandoned at this Hospital; for in reality in the vast majority of cases it serves neither of these functions. It is occasionally of value where the suspicion of infection arises and occasionally in rare cases where a pressure base-line is indicated.

(*c*) *Cerebral angiography* is playing an increasingly important role as a diagnostic aid in the doubtful case, although we naturally proceed directly to burr holes in the clear-cut case.

2. *Nursing Care of the Unconscious Patient Pre- and Post-operatively*:

(*a*) Maintenance of a free airway by posture, suction, and tracheotomy where necessary.

(*b*) Careful observation of vital functions and level of consciousness.

(*c*) Maintenance of adequate hydration and nutrition by naso-gastric tube.

(*d*) Control of hyperthermia when it arises.

(*e*) Prevention of bladder distension.

3. *Rehabilitation.* In this, our special Departments of Physiotherapy, Occupational Therapy and Speech Therapy are playing an increasingly important part.

CONCLUSION

If better results are to be obtained in the treatment of the severer head injuries which carry such a high mortality rate, centralization of such cases is imperative, for they need a highly specialized nursing team, the services of the trained neurosurgeon, and special facilities for bronchial toilet, temperature control, adequate nutrition and control of water and electrolyte balance.

OPSOMMING

1. Die bestek en werk van die Baragwanath-hospitaal se Paraplegiese Eenheid word in oënskou geneem.

2. Die gebrek aan geskikte huis- en beskutte werkfasiliteite bly die grootste struikelblok nadat die pasiënte die stadium bereik het waar hulle gesond genoeg is om uit die hospitaal ontslaan te word.

3. Daar word herhaaldelik na die werk van Ludwig Guttman verwys. Geen verskoning word hiervoor aangevoer nie, want die vooruitgang en vordering wat daar op die gebied van die rehabilitasie van paraplegie-lyers gemaak is, moet grotendeels toegeskryf word aan Guttman se deursettings- en volhardingsvermoë en sy bydraes tot hierdie vertakking van die mediese wetenskap.

As beter resultate verkry moet word met die behandeling van die ernstige kopbeserings wat so 'n groot aantal sterfgevalle veroorsaak, is dit dringend noodsaaklik om sulke pasiënte op 'n sentrale plek byeen te bring, want hulle het dringende behoefte aan 'n gespesialiseerde verpleegspan, die dienste van 'n opgeleide neurochirurg, en spesiale fasiliteite vir brongiale toilet, temperatuurkontrole, doelmatige voeding en beheer oor water- en elektrolitiese ewewig.

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NEUROLOGICAL DISORDERS AT BARAGWANATH HOSPITAL

A SURVEY

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Full-time specialist neurological services have been in existence at Baragwanath only since 1 November 1955. Statistical analysis over this short period is not likely to give a complete picture of neurological disorders as they occur amongst the urban Bantu population. However, this 12-month survey (January-December 1957) will give a general picture of the frequency of some conditions and the rarity of others. Of a total number of 3,545 neurological cases, 2,161 were traumatic and 1,384 were non-traumatic.

An analysis of the non-traumatic and inflammatory cases is given in Tables 1 and 2.

Multiple Sclerosis. It has for long been known that there was a very marked variation in the geographical distribution of multiple sclerosis and in this country a low incidence has always been accepted. That the disease occasionally occurs amongst White South Africans is not disputed; but that it occurs amongst our Bantu population has never been established. Two case reports of multiple sclerosis in the South African Bantu have been published.[1, 2] Subsequent developments have shown that neither of these patients, in fact, suffered from this disease. The second case was reported by one of us (R. L.) and a further report will be given of this case at a later date.

This Hospital serves about 400,000 people and we feel that, had any patients from this population suffered from so disabling a disease as multiple sclerosis, they would sooner or later have been seen at this Hospital. During the 12-month period under review, 1,384 patients suffering from non-traumatic neurological disorders were admitted. Among these there has not been one instance where we seriously

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TABLE 1: NON-TRAUMATIC NEUROLOGICAL DISORDERS

Inflammatory lesions		292
Epilepsy		296
Vascular lesions		287
Polyneuritis		48
Nutritional disorders		67
Beri-beri	5	
Pellagra with neuritis	3	
Pellagra with dementia	51	
'Shakers'	8	
Birth injury		101
Congenital lesions		27
Prolapsed inter-vertebral disc		11
Chorea		23
Tumours		17
Neurological complications of labour		7
Cerebral palsy		12
Paralysis agitans		7
Motor neurone disease		5
Muscular dystrophy		6
Cranial nerve lesions		25
Headache for investigation		7
Poisoning		87
Myasthenia gravis		1
Cervical spondylosis		1
Migraine		1
Neurological symptoms for investigation		56
Total		1,384

TABLE 2: ANALYSIS OF INFLAMMATORY LESIONS*

Tuberculosis		158
Meningitis	133	
Cerebral tuberculoma	5	
Spinal column	20	
Cerebral abscess		19
Syphilis		13
'Encephalitis and Myelitis'		21
Poliomyelitis		23
Encephalitis (post-infective)		3
Leprosy		6
Cerebral thrombophlebitis		39
Diphtheria		4
Mumps meningitis		3
Fungus infections		2
Cerebral malaria		1
Total		292

* (Excluding acute meningitis).

considered the diagnosis of multiple sclerosis. Several patients presented with disorders which possibly could have been considered as isolated incidents of a demyelinating process, e.g. optic neuritis. We have had 5 cases of optic neuritis, but in all the condition was simultaneously bilateral. This has always been regarded as a very uncommon occurrence in multiple sclerosis. Similarly, we have had several patients presenting with diplopia or cerebellar signs which, on further investigation, have been found to be due to other causes. We have had a few cases of unexplained paraplegia, but in these the follow-up period is too short to establish a diagnosis.

Careful inquiry amongst our colleagues who have had a much longer experience at this hospital has revealed that no case resembling the clinical picture of multiple sclerosis, as it is commonly encountered in Europe, has ever been seen here. Further, no autopsy has ever been carried out at this Hospital on a case of multiple sclerosis and this diagnosis has never been given as a cause of death. We have, therefore, come to the conclusion that this disease is a very rare condition amongst the Bantu if, indeed, it ever occurs.

Nutritional Disorders. We have also noted the comparatively low incidence of neurological disturbances attributable to nutritional disorder. The latter is one of the commonest conditions for which patients seek admission to our Hospital both in the paediatric and adult wards. In this survey there have been only 16 patients with neurological disorders (other than dementia) which could definitely be attributed to nutritional disorders. Of these 8 were 'shakers' as described elsewhere by Kahn.[3] There were 272 cases of pellagra, only 3 of whom showed definite evidence of peripheral neuritis and in all 3 there were other factors to be considered which made it uncertain that pellagra was the only cause of the periphral neuritis.

Cervical spondylosis, which has to-day become one of the most common diagnoses in neurology, is a rare cause of disabling symptoms at this Hospital. We have seen only one example.

Paroxysmal Trigeminal Neuralgia. It is noteworthy that in this series we have had only one case and even in this patient the diagnosis is by no means certain although she has recently been relieved by root section. This low incidence may be related to the fact that the Bantu population does not contain a high percentage of elderly folk.

Facial Migrainous Neuralgia. This related condition has only been seen occasionally,[4] and typical migraine is also notably rare.

Lumbar Disc Protrusion. In spite of the heavy manual work carried out by the majority of the Bantu population, this condition is uncommon. Only 11 cases were severe enough to warrant admission and of these only 2 who did not respond to conservative treatment were operated on. In both a total prolapse of the disc was found.

Subarachnoid Haemorrhage. This is a common condition and is found in about one sixth

(55 cases) of all patients suffering from cerebro-vascular accidents. A high percentage of these are shown to have aneurysms on carotid and vertebral angiography.

Malignant Disease. Of a total 1,120 patients admitted to the Hospital in whom a diagnosis of neoplasm was made, only 17 suffered from primary cerebral tumours.

Traumatic Cases. These, as described elsewhere in this Journal, form a major part of the work carried out in the Surgical Department at Baragwanath. No less than 2,103 head injuries and 58 spinal cord injuries were admitted during the year. Most of these cases were all serious, as a large proportion of the minor head injuries were 'slept over' in Casualty and allowed home next day. Shortage of beds made formal admission of these cases impossible because they have been estimated to be at least as many as those admitted. Had they all been admitted, as they should have been, our over-all mortality of 4.6% would have been appreciably lower. So far we have been unable to estimate the socio-economic morbidity, an assessment which would be far more revealing and interesting. This group included 42 subdural and extradural haemorrhages, and 4 intracerebral haemorrhages treated by operation.

Of 58 spinal injuries admitted, 47 had neurological signs severe enough to warrant special paraplegic treatment. At least half of these were due to stab wounds of the spinal cord.

The Paraplegic Unit which has been gradually developed over a number of years by the combined efforts of several specialist departments has continued to function satisfactorily during this year. Thirty-eight patients were admitted and 41 discharged. Of the latter, 27 who suffered partial lesions returned to their former occupations. The remainder were sent home or to sheltered employment, having been rehabilitated as far as our facilities allowed.

OPSOMMING

1. 'n Oorsig word verstrek van die neurologiese kwale wat gedurende 'n tydperk van 12 maande by die Baragwanath-hospitaal teëgekom is.

2. Die aandag word veral gevestig op die afwesigheid van bewese gevalle van multipele sklerose, die seldsaamheid van voedingskwale van die senuweestelsel, en ander siektes wat dikwels by blankes aangetref word.

3. Melding word kortliks gemaak van die rol wat deur die Neuro-chirurgiese Afdeling gespeel word in die behandeling van pasiënte wat aan traumatiese letsels van die kop en die ruggraat ly en tot die algemene chirurgiese sale van die hospitaal toegelaat word (sien elders in hierdie Tydskrif).

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TUMOURS OF THE GENITO-URINARY TRACT

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The records for the 5-year period January 1952–December 1956 reveal the admission of 120 patients suffering from primary malignant disease of the genito-urinary tract (Table 1). Carcinoma of the prostate constitutes 37.5% of this group. This is the commonest tumour of the genito-urinary tract in males. It would be misleading to compare these figures with those in Europeans as the numbers are too small. It is doubtful whether they are a true reflection of the incidence of malignancy of the genito-urinary tract, since most admissions are emergencies. Regrettably, the notes are often inaccurate and the Records Department is understaffed and poorly equipped.

Carcinoma of the Kidney. There were 11 adults with adeno-carcinoma and 6 children with nephroblastoma. There were no records of patients with tumours of the pelvis. The average age of the adults was 41. Nine of the tumours occurred in patients in the third and fourth decades. Three were in females. Nephrectomy was performed in 2 patients only. In the remainder extensive local and distant spread precluded surgery.

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Nephrectomy followed by radiotherapy was done in 5 children with nephroblastomata. The tumours in these children were extremely large but, in spite of their size, nephrectomy was performed followed within 3–4 days by irradiation. This principle follows that preferred by Gross. Surgery was declined in one patient who was lost to follow-up, as were the remainder following radiotherapy.

TABLE 1: CARCINOMA OF THE GENITO-URINARY TRACT (1952-1956)

	Prostate	*Kidney*	*Bladder*	*Penis*	*Scrotum*	*Testes*	*Total*
Number	45	Adult 11, Children 6 } 17	41	13	1	3	120
% of Total Genito-Urinary Carcinoma	37·5	14·2	34·2	10·8	0·8	2·5	100

Carcinoma of the Prostate. There were 45 cases out of 241 admissions for prostatic obstruction (18.3%). Ten of these died within 12 months. Most patients were between 50 and 80 years old.

The Relationship of Serum Alkaline and Acid Phosphatase and Bony Secondaries. The acid phosphatase was raised in 15 patients. Seven of these had bone secondaries. The remaining 8 had no radiological evidence of secondaries. The levels tended to be higher in those with secondaries (average 28.5 units compared with 23 units). There were 14 cases with bone secondaries. Seven had normal phosphatase levels, in the other 7 the phosphatase was raised (Table 2). As 8 of 31 cases without bone secondaries had raised acid phosphatase levels, it seems that high acid phosphatase levels occur almost twice as often in association with bone secondaries.

The alkaline and acid phosphatase levels were not related. In 9 patients with secondary deposits where the alkaline phosphatase had been estimated, it was significantly raised in 5. In 25 patients with no record of secondary deposits where the alkaline phosphatase had been recorded, it was raised in only 4. It appears that the alkaline phosphatase is raised frequently enough in patients with radiological secondaries to warrant X-ray of the lumbar spine and pelvis in every case in which this level is above normal, if carcinoma of the prostate is suspected. It is likely that bone secondaries were present in 3 cases with markedly raised alkaline phosphatase levels in which there was no record of X-ray examination.

Symptoms. The presenting symptom in 28 cases was some defect of micturition. It is interesting that the next most frequent complaint was pain in the pelvic region and lower limbs. This occurred in 15 cases. Haematuria was observed in 4 patients and 2 presented with acute retention.

Spread. Twenty-seven patients had either local or distant spread or both. Three with high alkaline phosphatase levels probably had bone secondaries and 5 cases were moribund on admission, making a total of 35 patients totally unsuitable for radical prostatectomy. It is thus evident that very few patients are seen sufficiently early to warrant curative treatment (i.e. radical prostatectomy). The usual treatment therefore consisted of controlling the growth with stilboestrol in large doses where the growth was responsive, and transurethral resection to relieve obstruction. Evisceration of the testes, which is probably the most suitable treatment in these patients since they frequently neglect to take stilboes-

TABLE 2: THE RELATIONSHIP BETWEEN ACID AND ALKALINE PHOSPHATASE LEVELS AND BONE SECONDARIES

		Acid Phosphatase			*Alkaline Phosphatase*		
	Number of Cases	*Normal Acid Phosphatase*	*Raised Acid Phosphatase*	*Average Level K.-A. Units*	*Number of Cases*	*Normal Alkaline Phosphatase*	*Raised Alkaline Phosphatase*
With bone secondaries	14	7	7	28·5	9	4	5
No bone secondaries	31	23	8	23	25	21	4

trol, could seldom be done as most patients refused to have the operation.

The basis for the diagnosis of carcinoma of the prostate in 33 patients was one or more of the following criteria:

(a) Raised acid phosphatase plus positive rectal findings.
(b) Radiological bone secondaries plus positive rectal findings.
(c) Positive biopsy.
(d) Carcinoma found at autopsy.

The remaining 12 cases are probably carcinoma of the prostate, on the bases of positive rectal findings, cystoscopic appearances and the history of urinary symptoms.

Carcinoma of the Testis. There were 3 patients all between 30 and 45 years of age and with widespread secondary deposits when first seen. They died within 12 months.

Carcinoma of the Penis. There were 13 cases. Amputation was performed in only 5; the rest refused amputation in any circumstances, so that radiotherapy was the treatment most commonly employed. These patients have no follow-up record.

Carcinoma of the Bladder. Forty-one cases of vesical tumour were admitted during the period 1952–1956 and 23 during 1949–1951 totalling 64 in all. There were 12 females and 52 males. Most of these cases were admitted in a seriously debilitated condition as a result of the advanced stage of their disease. In 21 instances hospitalization, before death supervened, averaged 26 days. Five patients were moribund on admission.

Of the 43 remaining cases 4 refused hospital treatment in spite of large tumours which caused disabling symptoms. Curative treatment could be offered to only 7 of the remaining 39 cases. These were benign papillomata in 6, which responded to simple fulguration. The seventh case was a simple leiomyoma treated by partial cystectomy.

Due to perivesical extension, secondary metastases and the extreme size of the tumour, the 32 cases of vesical neoplasm were deemed inoperable and incurable (Table 3). Palliative measures were therefore adopted. In addition, many of these presented with evidence of ureteral obstruction on pyelography and uraemia was common. In 8 cases where ureteral obstruction was likely to cause early death, uretero-colic anastomosis was done in the hope that further therapy could be offered later. Of these 8 cases, 5 died within 3 months, 1 survived 3 months and another (who had been given preliminary radiotherapy) survived 1 year. The latter 2 were then lost to follow-up. In 11 cases, cystectomy was com-

TABLE 3: TUMOURS OF THE BLADDER
23 CASES (1949–1951); 40 CASES (1952–1956)

Type	*Benign*	*Malignant*	*Total*	*Deaths (Indicated in brackets)*	*Treatment*		*Total*
	7	57	64	Died within 1 month (22)	Refused hospital treatment		4
Papilloma	6			Nil.	Partial cystectomy	5	7
Leiomyoma	1			No follow-up longer than 9 months.	Partial cystectomy + tantalum wire (Irradiation)	2	
Squamous carcinoma		7	23	6th post-operative day, pulmonary embolus (1)	Total cystectomy with ureterocolic anastomosis		11
Squamous carcinoma + bilharzia		12+4=16		At 9th, 10th, 13th day and 2nd month (4)			
Type unknown		22	22	No follow-up after 6 months (6)			
Transitional cell carcinoma		3	3	Within 4 months (7)	Ureteroo-colic anastomosis	7	8
Transitional cell carcinoma + bilharzia		1	1	Survived 1 year. No follow-up thereafter (1)	Uretero-colic anastomosis + previous irradiation	1	
Anaplastic + bilharzia		2 1	3	(1) No follow-up after 6 months	Fulguration Fulguration + intracavitary radium	4 3	7
Spheriodal cell + bilharzia		2	2	2 within 2 months	Laparotomy		2
Adenocarcinoma + bilharzia		1	2	On 15th day (1)	Bilateral nephrostomy (blood urea: 345 mg. per 100 cc.)		1
Dual. Squamous + transitional cell carcinoma + bilharzia		1		5½ + 3 months (2)	Suprapubic cystostomy + fulguration		2

bined with uretero-colic anastomosis, when a reasonable chance of complete extirpation was thought possible or when disabling urinary symptoms and excessive haematuria occurred. No case was judged to be capable of cure at operation as extra-vesical spread was evident in all.

Nevertheless, in all the 11 cases subjected to cystectomy, relief from pain and urinary obstruction justified the procedure. There was one death on the sixth post-operative day from pulmonary embolus. Ten survived varying periods. Six were lost to follow-up 2–3 months after discharge from hospital, but were in reasonable health, free from pain and with good urinary control rectally. Four were known to have died at 2 months (jaundice and cholaemia), 10, 11 and 13 months after operation.

Partial cystectomy was done in 7 cases where the growths were in the fundus. In these, except for one where the tumour was benign, peritoneum was invaded. Radio-active tantalum wire was inserted along the line of incision in 2 cases. The survival period in this group averaged 9 months, when they were lost to follow-up. Evidence of radiation cystitis was present in the 2 cases in which tantalum had been used. Radiotherapy was seldom employed because of the excessive size of the tumours, necessitating the adoption of the more heroic surgical procedures mentioned.

Intracavitary radium in the form of radium needles inserted in a Foly catheter was the method used after fulguration of the tumour in 3 cases. Radiation cystitis again proved troublesome. These 3 cases were lost to follow-up in 3–12 months, so that it was impossible to evaluate this method more accurately.

Symptomatology. The predominant symptom was haematuria, but evidence of infection, ulceration and phosphatic encrustation was manifested by frequency, burning on micturition and lower abdominal pain. Ureteric and bladder neck obstruction by large tumour growth was frequent, producing high blood urea levels.

Age. The average was 49.8 years. A striking feature was the fact that of the malignant neoplasms there were 15 patients between the ages 28–38, in 11 of whom the carcinoma (mainly squamous in character) was associated with bilharziasis. Several of these Africans were from foreign territories, Nyasaland and Portuguese East Africa.

Pathological Features (Table 4). The commonest type of tumour was the squamous carcinoma, present in 23 cases (36.5%). Bilharziasis was associated in 12 of these and in 4 others bilharziasis was suspected because of the presence of pigment, calcification of the bladder or residence in an endemic area. In 21 cases there was no evidence of the type of carcinoma, as no biopsy or autopsy was obtainable. Bilharziasis was also associated with several other tumours. In one case associated with bilharziasis a dual pathology was present in the form of a transitional celled carcinoma at the fundus and a squamous carcinoma at the bladder neck.

The association of bilharziasis and squamous carcinoma in particular was deemed sufficiently interesting and disturbing to warrant the inclusion of a series of both European and non-European cases for comparison. As can be seen (Table 4) the incidence of squamous carcinoma in the European is low (7.7%) and the overall association of bilharziasis with malignant vesical tumour was 1.1%. In the African, however, squamous carcinoma (53.6%) was the commonest type and was associated with bilharziasis in at least 34.3% of cases. The overall incidence of bilharzia in African vesical neoplasms was 24.8%. This close association of bilharzia with the squamous carcinomata is sufficiently suspicious to warrant further scrutiny and investigation. This Unit at Baragwanath is prepared to do so if cases could be channelled here.

CONCLUSIONS

1. A brief review of the occurrence of neoplastic conditions of the urinary tract at Baragwanath Hospital is given. These concern mainly African patients.

2. The commonest tumours were those of the bladder and the prostate. The incidence of prostatic carcinoma was 18.2% of 241 cases of prostatic obstruction.

The commonest symptoms and the relationship of phosphatase levels to bone secondaries are briefly discussed.

3. The vesical carcinomata were extremely advanced in a very high percentage of cases, precluding any hope of cure. Only palliation could be practised.

Total cystectomy and uretero-colic anastomosis proved helpful in relieving symptoms in many cases.

Newer techniques in field irradiation may prove more beneficial than radical surgery when combined with measures such as uretero-

colic or uretero-ileal anastomosis to relieve the urinary obstruction.

The association of bilharzia and squamous carcinoma is commented upon and a comparison with the European is made.

4. The status of neoplastic disease in the African is depressing. The majority of cases, both young and old, present with disease advanced beyond cure.

A plea is made to all those concerned in the management and direction of African medicine and health for earlier diagnosis, so that the lot of the individual may ultimately be improved.

OPSOMMING

1. 'n Kort oorsig van die voorkoms van neoplastiese toestande van die urinêre kanaal by die Baragwanath-hospitaal word verstrek. Dit het hoofsaaklik betrekking op naturelle-pasiënte.

2. Die mees algemene gewasse was dié van die blaas en die prostata-klier. Prostata-karsinoom het by 18.2% van 241 gevalle van prostata-obstruksie voorgekom.

Die simptome wat die meeste voorgekom het, en die verwantskap tussen fosfatase-peile en beensekondêres word kortliks bespreek.

3. In 'n hoë persentasie van die gevalle het die blaas-karsinome reeds so 'n gevorderde stadium bereik dat enige hoop op genesing uitgesluit was. Dit was slegs moontlik om verligtingsmaatreëls toe te pas.

Algehele blaasuitsnyding en uretero-dikderm-anastomose was in baie gevalle van waarde vir die verligting van die simptome.

Die jongste tegnieke op die gebied van veldbestraling kan heilsamer wees as radikale chirurgie as hulle verenig word met maatreëls soos uretero-dikderm- of uretero-ileumanastomose vir die verligting van urinêre obstruksie.

Kommentaar word uitgeoefen op die assosiasie tussen bilharzia en plat karsinoom, en 'n vergelyking met blankes word getrek.

TABLE 4: PATHOLOGICAL FEATURES OF CARCINOMA OF THE BLADDER (COMPARED WITH FEATURES IN EUROPEANS)

		Transitional Cell Papilloma	*B%*	*Transitional Cell Carcinoma*	*B%*	*Squamous Carcinoma*	*B%*	*Anaplastic Carcinoma*	*B%*	*Undifferentiated*	*B%*
European	Totals	119	0	148	1	23	1	2	0	—	—
	Percentage	39·5	0	49·5	·67	7·7	4·3	·6	0	—	—
Non-European	Totals	4	0	45	3	67	23	8	3	1	1
	Percentage	3·2	0	36	8·3	53·6	34·3	6·4	37·5	·8	100

		Squamous Papilloma	*B%*	*Urachal Adeno-Carcinoma*	*B%*	*Adeno-Carcinoma*	*Bilharzia Associated with Carcinoma*
European	Totals	—	—	1	—	3	2 of 180 patients with Ca } 1·1%
	Percentage	—	—	·3	—	·9	
Non-European	Totals	1	—	—	—	3	30 of 121 patients with Ca: 24·8%
	Percentage	·8	—	—	—	2·4	

B=% associated with bilharziasis

4. Die status van neoplastiese kwale by die naturel is terneerdrukkend. Die merendeel van die pasiënte, sowel jonk as oud, word na die hospitaal gebring as die siekte reeds ongeneeslik is.

'n Beroep word gedoen op almal wat betrokke is by die bestuur van geneeskundige en gesondheidsmaatreëls onder die naturelle om hulle vir vroeëre diagnose te beywer sodat die lot van die individu uiteindelik verbeter kan word.

Our thanks are due to Mr. Heywood of the Registry Department for his ready assistance and to our numerous rotating Housemen and Registrars for their vigilance of these difficult cases.

RUPTURE OF THE UTERUS

REPORT ON A FURTHER SERIES OF CASES WHICH OCCURRED IN BANTU PARTURIENTS OF JOHANNESBURG DURING 1956-57

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Since the presentation of a group of 50 cases of rupture of the uterus (Lavery 1955) a further series of 49 cases has occurred in a period of 2 years at the Obstetric Unit, Baragwanath Hospital, Johannesburg.

The reason for repeating the study of uterine rupture was to see if there had been any notable change in the incidence of the accident and whether, as a result of the general use of lower segment caesarean section in hospital practice these days, there was any increase in the incidence of rupture of previous section scars.

In the earlier series, the incidence at this obstetric unit was found to be the highest in the published results, being 1 rupture in 137 deliveries. In the latest analysis the incidence is still high, being 1 rupture in 219 deliveries. This lower incidence is more apparent than real in that the unit turn-over has increased from 6,857 deliveries in a 2½-year period to 10,735 deliveries in a 2-year period.

In considering the age incidence a marked difference is present between the two series. Formerly the average age of occurrence of this accident was 30.5 years (range 15 to 45 years) while in the present series the average age has dropped to 28.6 years (range 17 years to 38 years). Table 1 compares the 2 series in age groups.

It has been confirmed in this series that rupture of the uterus does occur in a lower parity group than in the White patient. In the previous report the range of parity was between primigravida and gravida 13 with an average of 4.2 pregnancies. In the present series the range is between para 1 and para 10 with an average of 3.0 pregnancies. The larger number of ruptures occurred in the patients pregnant from 1 to 4 times (38 cases) while only 11 ruptures occurred in patients pregnant between 5 and 10 times. It is possible that the occurrence of more ruptures of the uterus in the lower parity groups goes *pari passu* with the lowered age incidence.

The type of rupture which occurred in this series has undergone a decided change from that which occurred previously. Whereas 90% of ruptures occurred in the spontaneous 'primary' group in the preceding series, i.e. rupture in an undamaged and non-incised uterus, and 10% occurred in the spontaneous 'secondary' group, we find now, that 53% of ruptures occurred in the spontaneous primary group and 47% in the spontaneous secondary group.

TABLE I

Age Group	*Previous Series* (50 *cases*)	*Present Series* (49 *cases*)
15 to 24 years	8 cases	13 cases
25 to 30 years	20 cases	16 cases
31 to 35 years	9 cases	13 cases
36 to 40 years	10 cases	7 cases
40 to 45 years	3 cases	0 cases

Of the 49 cases of rupture of the uterus which occurred in the last 2 years, 24 (48.8%) were found in patients whose uterus had either a previous caesarean section scar, or a myomectomy scar/scars, while in 15 (30.6%) of ruptures the tear was apparently spontaneous. In 10 patients (20.6%) it was thought that obstetric trauma, in attempting delivery *per vaginam*, contributed in some way to the production of the rupture.

An analysis of the 24 cases of rupture occurring in scars of previous caesarean sections and myomectomy reveals that there were 2 cases in whom classical section had been done,

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2 cases who had had myomectomy performed and 20 cases who had had a transverse lower segment caesarean section performed in a previous pregnancy. In only 2 of these 24 cases was the rupture diagnosed as having occurred, viz. in the classical section scar rupture and one case in which a scar had torn and had extended into the intact uterus. The rupture was found on routine examination of the lower uterine segment under anaesthesia following vaginal delivery in 11 cases. This examination is now routine procedure in my unit when a history of previous caesarean section is obtained, whether or not delivery is spontaneous or assisted. In a further 11 cases the rupture of the scar was discovered at repeat caesarean section after trial of labour. In a small percentage of cases the caesarean section was performed a little earlier because it was suspected that the previous scar was in danger of rupturing, but on the whole the indication for repeat caesarean section was, in the main, other features of the case.

Only 4 cases of the ruptures through previous scars were judged to have been precipitated by the trauma associated with vaginal delivery. These were 2 cases in whom forceps delivery had been performed, and 2 cases who had an internal podalic version and breach extraction performed for transverse presentations.

The patients in this group comprise almost 50% of the total cases in this series and this feature is quite different from that in the original series, in which ruptures through caesarean section scars comprised a mere 10% of the total.

In 15 patients of this group, the rupture was repaired, 11 at the time of repeat caesarean section and 4 by laparotomy following vaginal delivery. In 7 patients the scar rupture was not repaired—either because the patient refused permission for laparotomy, or because the medical attendant judged that watchful expectancy was all that was required. This latter form of treatment was successful in this series, but is open to question, particularly when one considers the aetiology of rupture of the uterus. There is no doubt that the treatment of choice must be repair in all cases of rupture of the uterus. In the remaining 2 cases, one patient who had had 2 previous lower uterine segment sections and had now suffered a rupture through a scar, was subjected to hysterectomy because of the poor condition of the lower segment. The other case (a rupture through a previous classical section scar) was treated by extending the rupture to coincide with the whole of the previous scar and the uterus closed in the usual classical section method She was sterilized.

An interesting feature of this group of patients who suffered a rupture through a caesarean section scar is the number of cases in which the medical attendants considered that after repair of the rupture, the condition of the uterus was such that they were prepared not to sterilize the patient. This occurred in no less than 15 of the 24 cases, a state of affairs with which I cannot fully agree.

It may be that in the previous series the greater number of primary spontaneous ruptures caused more extensive damage to the lower uterine segment, necessitating a higher rate of sterilization after repair. I would like to repeat that the procedure adopted in this Unit of attempting repair of even extensive ruptures rather than to perform hysterectomy was decided on for two reasons: firstly because the Bantu patients want to keep the uterus almost at all costs and, secondly, because it was felt that repair was less shocking than hysterectomy and was thus to the patient's benefit in all but the most hopeless cases.

The next point of interest emerging from a study of these 24 ruptures occurring in scars of the uterus is the fact that in only 2 cases was the rupture complete. In the first case the rupture occurred in a previous classical section scar, and in the second the patient had had a myomectomy and in the pregnancy which followed had suffered a partial rupture involving the left broad ligament. In her second pregnancy it was decided to perform an elective section at term, and after approximately 2 hours of the first stage of labour a caesarean section was ordered. At section it was found that one of the myomectomy scars on the posterior surface of the lower segment had ruptured. She was promptly sterilized at the end of the caesarean section.

Because the ruptures occurring in previous uterine scars in this group were mostly partial, the foetal salvage was particularly good. In all 19 infants were born alive and 5 were stillborn. Of the stillborn infants, one occurred in the patient whose classical section scar had ruptured through all layers and the foetus had been extruded into the peritoneal cavity; 3 infants presented as transverse (shoulder) presentation necessitating internal version and breech extraction; and the remaining infant was delivered by mid-forceps with extreme difficulty because it weighed 9 lb. 13 oz. and shoulder dystocia caused undue delay in delivery.

Thus, while it becomes clear that rupture of a previous transverese lower segment caesarean section scar is becoming more evident these days, nevertheless the prognosis for mother and child appears to be reasonably good. In this series there were no maternal deaths resulting from rupture of the uterus through a scar, and only one foetus died as a direct result of rupture. The late prognosis, however, is poor as regards number of pregnancies possible because one tends to sterilize the patient earlier than usual.

In this series of 49 cases of rupture there were 13 instances in which it could be postulated that obstetric interference *per vaginam* had contributed in some way to precipitating rupture of the uterus. In 5 cases, the Bantu characteristic of premature bearing down with an incompletely dilated cervix or malpresentation or obstruction was present, and attempts at vaginal delivery decidedly led to rupture. Two cases presented with malpresentation alone and internal manipulations (internal version for a transverse lie, and brow presentation of the second twin) were responsible in part for the tearing of the uterus. In 2 cases a craniotomy on a dead foetus in the presence of an unsafe uterus resulted in a rupture, and in the remaining 4 cases rupture occurred through a scar in the lower uterine segment after vaginal manipulations necessary to effect delivery (2 internal versions and breech extractions for transverse presentations and 2 forceps deliveries for occipito-posterior positions of the foetus).

In this group of ruptures associated with obstetric trauma, there were 2 maternal deaths and, although the ruptured uterus was not the sole factor in causing death, nevertheless this trauma to the uterus swung the balance away from the chance of recovery.

There were 5 complete and 8 partial or incomplete ruptures in this group. In 6 patients the rupture was not repaired because the tear was small and partial, or because the patients refused operation or because the delay between occurrence and recognition had exceeded safe bounds. In 5 cases the patient was subjected to laparotomy and the uterus was repaired and in the remaining 2 cases the damage to the uterus was so extensive that it was considered better to remove the organ.

In the group of spontaneous (primary) ruptures of the uterus there were 15 cases in all. The picture presented by these patients is almost identical to that produced in the original series of 50 cases.

Thirteen of the 15 cases were examples of neglected labour, which was the prime factor in the uterine rupture. These patients were brought to our Unit after many hours of futile labour in their homes and in 9 patients the uterus had ruptured before admission or immediately after. These cases again demonstrate the characteristic expounded in the first series reported, i.e. the tendency to premature bearing down in the face of insuperable obstruction, malpresentation or an incompletely dilated cervix.

In 2 cases the rupture followed an apparently normal delivery, both patients were para 3 and no obvious factor was obtained from the history to suggest trauma in their previous pregnancies.

Rupture in this group was complete in 13 patients and incomplete in two. There were 4 maternal deaths as a result of the injury and subsequent complications.

In none of these patients was any attempt made to terminate labour by vaginal manipulations, because the Unit is well aware of the dangers associated with vaginal interference in this type of case.

The treatment of this group consisted of 9 repairs with 6 sterilizations and 4 hysterectomies because of extensive damage prohibiting repair. One patient with a partial rupture following normal vaginal delivery refused operation and repair and was treated conservatively with success, and the remaining patient was admitted to the Unit with an obvious complete rupture, extruded foetus and excessive amounts of blood in the abdomen. She died undelivered before any treatment at all could be instituted.

Foetal loss was very high, as could be expected with 13 complete ruptures. Eleven infants were stillborn, 3 were born alive and one was not delivered. Of the 3 live births, 2 babies were born vaginally and the mothers suffered a partial rupture; the remaining one was born vaginally and after delivery the mother suddenly collapsed as a result of a complete and extensive tear in the lower segment.

The maternal death rate for the whole group was 9 deaths in 49 ruptures (18.3%). In the first series reported the maternal death rate was 16 (32.0%) and it appears as though we have attained a modicum of success in treating this rather severe type of obstetric accident. However, the success is not as significant as it appears because whereas in the first series the incidence of spontaneous (primary) ruptures was 90%; in this series this has dropped to 53%. The death rate depends on the number

of spontaneous (primary) ruptures, which are always more extensive in nature and nearly always complete. In the spontaneous (secondary) group the incidence has jumped from 10% in the first series to 47% in this series, and this type of rupture is usually partial or incomplete in nature. If, then, we exclude the spontaneous (secondary) rupture group, the mortality rate is 9 deaths in 25 ruptured uteri (36%).

An analysis of the maternal deaths reveals that all patients had spontaneous (primary) type of rupture. In 4 cases obstetric interference from below may have precipitated rupture: these were 3 craniotomies performed on large dead foetus, because of prolonged obstructed labour, and 2 internal versions followed by breech extractions in patients with foetus presenting transversly. The interference by the attendants in these cases must be condemned because there is no doubt that the uterus was not safe in any of these 4 cases.

One patient delivered her infant vaginally and then collapsed as a result of a rupture involving both broad ligaments. A subtotal hysterectomy was performed and the patient transfused with 13 units of whole blood, but she did not survive.

Table 2 summarizes the main points concerning these maternal deaths.

In the treatment of this condition one is guided by the patient's symptoms. Where the rupture is complete through all layers of the uterus, recognition of the condition must be prompt and supportive therapy instituted without delay. Whole blood, ACTH intravenous drip therapy and routine anti-shock measures must be commenced quickly, followed by laparotomy as soon as the patient's condition permits. As to whether the uterus should be repaired or removed, the experience gained in this matter at this Hospital points decidedly to repair wherever possible. Thus in this Unit a uterus is repaired even though it appears quite hopeless. In this series there were 20 complete ruptures of which 12 were repaired with 3 deaths and 7 had a hysterectomy with 4 deaths.

TABLE II

No.	*Type of Rupture*	*Predisposing Factors*	*Treatment*	*Cause of Death*
1.	Complete Spontaneous Primary	Prolonged labour. Rupture imminent. Ruptured before caesarean section could be performed	Repair	Shock. Haemorrhage
2.	Complete Spontaneous	Craniotomy for 11 lb. stillborn infant	Hysterectomy	Shock. Haemorrhage
3.	Complete Spontaneous Primary	Prolonged obstructed labour. Craniotomy	Repair	Pulmonary. Oedema
4.	Complete Spontaneous Primary	Transverse lie. Internal version breech extraction. Couvelaire uterus. Accidental haemorrhage	Repair	Shock. Haemorrhage
5.	Complete Spontaneous Primary	Prolonged labour. Admitted with rupture. Collapse post-operative. Haemorrhage from slipped ligature. Subtotal hysterectomy	Repair and Subtotal Hysterectomy	Shock
6.	Complete Spontaneous Primary	Prolonged obstructed labour. Premature bearing down	Hysterectomy	Shock. Haemorrhage
7.	Complete Spontaneous Primary	Prolonged labour: Normal delivery. Broad ligament effusions. 13 units blood transfusion	Hysterectomy	Shock. Haemorrhage
8.	Complete Spontaneous Primary	Obstructed labour. Died undelivered	Nil	Shock. Haemorrhage
9.	Partial Spontaneous Primary	Transverse lie. Internal version breech extraction. Broad ligament effusions	Repair	Adrenal failure

The Problem of Sterilization of Patients after Repair of a Rupture of the Uterus. In the previous series reported, sterilization was considered to be a *sine qua non* of repair, because of the higher incidence of complete spontaneous primary type ruptures. This aspect has changed in the present series in that of the 49 cases of rupture 17 patients were sterilized and 24 were not. In the group of patients with rupture of a previous scar in the uterus no less than 15 of the 24 were not sterilized, because it was felt that the repair of the rupture scar was strong and sound and because the obstetric history was such that it was considered permissible to allow a further pregnancy to occur.

In presenting this series one has considered 3 main groups—rupture through previous section scars, ruptures associated with obstetric trauma and spontaneous primary ruptures. A summary of the whole group of 49 cases is now given to assist in forming an impression of the condition found at this hospital.

Total Ruptures: 49.

Complete type	20	(8 maternal deaths)
Partial or incomplete type	29	(1 maternal death)
Rupture through scar	24	
Rupture associated with obstetric interference	13	
Rupture—spontaneous	15	
Maternal deaths	9	
Live birth	23	
Stillbirth	25	
Undelivered	1	
Unbooked cases	40	
Booked Cases	9	
Blood transfusions	29	
Average for patient	3 × 500 cc. each	
Treatment:		
Repair of uterus	33	
Repair of complete rupture	12	(3 maternal deaths)
Hysterectomy for complete rupture	7	(4 maternal deaths)
Repair of partial rupture	16	No maternal deaths
Hysterectomy for partial rupture	1	No maternal deaths
Conservative treatment	7	

SUMMARY AND CONCLUSIONS

A further 49 cases of rupture of the pregnant uterus are presented.

The incidence for this accident in Bantu women is still high—one rupture in 219 deliveries.

The incidence of rupture through a previous scar has increased from 5 in 50 in the previous series to 24 in 49 pregnancies in this series. This increase is due probably to two factors:

(*a*) Greater use of caesarean section in the last 8 years;

(*b*) Greater use made by Bantu patients of hospitals and a desire to return for subsequent pregnancies and labours.

There is an improvement in the incidence of complete rupture when compared with previous series. Formerly complete rupture comprised 76% of the 50 cases reported whereas to-day this incidence has dropped to 40.8% of 49 cases.

It appears as though prognosis for mother and child is good when rupture occurs through a previous scar—but is unchanged in the spontaneous primary group of complete ruptures.

The uncorrected maternal death rate of 9 deaths in 49 patients (18.3%) is much better than in the previous series reported. If, however, the scar ruptures are excluded, the death rate rises to 9 deaths in 25 (36%).

It is re-iterated that repair of the uterus is safer for the mother than hysterectomy and that the effusions into the broad ligament associated with rupture are still to be feared.

OPSOMMING

'n Verdere 49 gevalle van verbreking van die swanger baarmoeder word beskryf.

'n Groot aantal van hierdie soort ongelukke kom nog steeds by Bantoe-vrouens voor—een verbreking per 219 verlossings.

Die voorkoms van verbreking deur 'n vroeëre litteken het vermeerder van 5 in 50 in die vorige reeks tot 24 in 49 swangerskappe in hierdie reeks. Hierdie vermeerdering moet waarskynlik aan twee faktore toegeskryf word:

(*a*) Die groter gebruik wat daar gedurende die afgelope 8 jaar van keisersneë gemaak is;

(*b*) Die groter gebruik wat Bantoe-pasiënte van hospitale maak, gepaard met die verlange om terug te keer vir latere swangerskappe en bevallings.

Daar is 'n verbetering in die voorkoms van algehele verbreking in vergelyking met die vorige reeks. Vroeër het 70% van die 50 gevalle waaroor daar verslag gedoen is uit algehele verbreking bestaan. Tans het dit gedaal tot 40.8% van 49 gevalle.

Dit skyn asof die prognose vir moeder en kind goed is as die verbreking deur 'n vroeëre litteken geskied—maar dit bly onveranderd in die spontane primêre groep van algehele verbrekings.

Die ongekorrigeerde moederlike sterftesyfer van 9 sterfgevalle onder 49 pasiënte (18.3%) is veel beter as in die vorige reeks waaroor verslag gedoen is. Indien die litteken-verbrekings egter uitgesluit word, styg die sterftesyfer tot 9 sterfgevalle in 25 (36%).

Daar word herhaal dat die herstel van die baarmoeder veiliger as histerektomie vir die moeder is, en dat uitstortings in die breë ligament, wat met verbreking geassosieer is, nog steeds gevrees moet word.

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THE NEPHROTIC SYNDROME IN PREGNANCY

A REVIEW OF 20 CASES

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The nephrotic syndrome is distinctive and consists of oedema, proteinuria, hypo-albuminaemia and hyperlipaemia, without hypertension or urea retention.

The association of the nephrotic syndrome and pregnancy has received scant attention in the obstetrical literature. At Baragwanath Hospital the association is not uncommon and, in a previous report of 7 cases,[1] it was shown that with proper care there is usually a favourable outcome. This experience constitutes an exception to the generally held view that the maternal and foetal prognosis is poor when pregnancy is associated with chronic renal disease. This may be because, contrary to the more usual forms of chronic renal disease, the blood pressure and the renal function in the typical case of the nephrotic syndrome are normal.

In this paper we review 20 cases (with 21 pregnancies) of the nephrotic syndrome associated with pregnancy in Bantu females seen at this Hospital during the period 1955–1957.

Mode of Presentation and Diagnosis. In all cases but one (where the syndrome was diagnosed 1 month before conception) the syndrome presented for the first time before the 28th week. In all, the principal complaint was progressive swelling of the lower limbs.

At the first examination there was massive oedema of the lower limbs, often extending well up the trunk. All had blood pressures of 120/80 mm. Hg or less. Examination of the urine revealed proteinuria (Esbach 0.5–24 g./l.), normal concentrating power (specific gravity 1020 or more), varying numbers of fatty, hyaline and granular casts, epithelial cells and occasionally a moderate excess of erythrocytes and leucocytes.

The Biochemical Findings: Serum albumin ranged between 0.6 and 1.7%, 9 cases showing levels of 1% or less; serum globulin varied from 1.6–4.8%. Plasma cholesterol ranged from 180 to 540 mg. per 100 c.c., a level of 280 mg. per 100 c.c. or more being recorded at some stage in the pregnancy in all cases except one, in which the highest value was 225 mg. per 100 c.c. The blood urea was between 7 and 30 mg. per 100 c.c., in 12 cases never rising above 20 mg. per 100 c.c.

It should be emphasized that the diagnosis of the nephrotic syndrome in pregnancy is easily made. This is especially true of early pregnancy. When the case is seen for the first time in late pregnancy, it may be confused with pre-eclampsia. Here the diagnosis of the syndrome may be strongly suggested by a history of oedema starting relatively early in pregnancy, by the association of marked oedema and proteinuria with a normal or mildly elevated blood pressure, by the typical biochemical picture and will be confirmed on follow-up after delivery.

Course of Pregnancy. On a standard regime of bed rest and a high protein, low sodium diet the behaviour of the oedema was variable, tending to increase as pregnancy advanced. Ambulation was usually associated with a more rapid increase in oedema. In 9 cases there were transient elevations of blood pressure. In 6 the maximum blood pressure recorded was 150/90 mm. Hg, while in the other 3 the highest levels were 170/108, 180/100 and 150/100 mm. Hg. In all cases the hypertension responded rapidly to bed rest and mild sedation. While the variation in the levels of blood urea and serum albumin throughout the course of pregnancy were small, the plasma cholesterol, the serum globulin and the proteinuria fluctuated widely. None of these variations bore any relationship to the course of pregnancy.

Foetal Prognosis. There were 22 infants from 21 pregnancies. All the infants were born alive. Fourteen normal infants were

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born between 38 and 40 weeks. In 2 the weights were unknown and in 12 ranged from 5.7 to 7.1 lb. Three were born between 38 and 40 weeks but weighed less than 5.5 lb. Two weighed 5.3 lb. and the other, 5.1 lb. One of these infants was a female pseudohermaphrodite and the other 2 were normal. The remaining 5 infants were born between 34 and 38 weeks (twin: 5.4 and 5.3 lb.; 5.1, 4.9 and 4.4 lb.). Four of these were normal and 1 (4.9 lb.) died of white asphyxia after a complicated delivery in the 36th week of pregnancy. All the placentae were macroscopically normal except 1 which had 3 small white infarcts.

Course After Delivery. The oedema began to subside immediately after delivery and within a few days or weeks was either slight or absent. This reduction of oedema was not associated with a corresponding improvement in the biochemical findings or the proteinuria. The blood pressure, blood urea and renal concentrating power remained within normal limits.

Maternal Prognosis and Complications. In view of the shifting character of the population served by the Hospital, the usual period of observation after delivery has been only about 1 month. One case has been followed through 2 pregnancies for 19 months. Owing to the short follow-up periods, only observations regarding immediate maternal prognosis can be made.

The oedema was markedly aggravated even at a relatively early stage in pregnancy, but there was no evidence that renal function had been adversely affected, either during or after pregnancy, as determined by blood urea estimations and renal concentrating power.

It is possible that the transient rises in blood pressure referred to were manifestations of superimposed pre-eclamptic toxaemia. Severe pre-eclampsia, however, has not been observed.

Two groups of complications encountered in the present series must be emphasized. The first is a susceptibility to infection which is a well-recognized complication of the nephrotic syndrome. Three patients developed pulmonary infections, one a thigh abscess and one puerperal sepsis. All these responded to antibiotic therapy. The second complication is a tendency to venous thrombosis in the puerperium, to which both the nephrotic syndrome[2] and the puerperal state may contribute. One case developed an ilio-femoral thrombosis which responded to anticoagulant therapy and a second patient died 4 weeks after delivery. At autopsy massive pulmonary infarction was found to be the cause of death and it is significant that the renal histology was virtually normal. This was the only maternal death in the series and occurred before the routine prophylactic use of anticoagulants had been commenced.

Management. Four points warrant comment:

(*a*) In the treatment of the oedema the following were used either alone or in combination: ACTH, cortisone, dextran (6%, large molecule), cation exchange resins, acetazolemide (Diamox) and the standard regime of bed rest, and a low sodium and high protein diet. Of these the standard regime has been the most useful form of long-term therapy. To tide cases over periods of extreme oedema the administration of dextran has proved very effective. The other measures have been disappointing, cortisone and ACTH in particular tending to aggravate the oedema.

(*b*) The hypertension has always responded rapidly to the standard regime and mild sedation.

(*c*) In no case has therapeutic abortion been performed nor has it been found necessary to induce labour prematurely.

(*d*) Infections acquired during pregnancy should be vigorously treated, and it is suggested that antibiotic therapy be employed prophylactically in the puerperium.

For the tendency to thrombosis in the puerperium the prophylactic use of anticoagulants is likewise recommended.

SUMMARY

The clinical features, course, complications, prognosis and management of the nephrotic syndrome in pregnancy in 20 cases are reviewed.

OPSOMMING

Die kliniese kenmerke, verloop, verwikkelinge, prognose en bestuur van die nefrotiese sindroom tydens 20 gevalle van swangerskap word in oënskou geneem.

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ANAESTHESIA FOR CAESAREAN SECTION

AN ANALYSIS OF 747 CASES

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Anaesthesia for caesarean section has always been of great interest to the anaesthetist, because his responsibility is for two lives instead of one, and he may sometimes find that the anaesthetic of choice for the one is not necessarily the best anaesthetic for the other. Moreover, that the ideal anaesthetic has not yet been found, is proved by the variety of anaesthetics advocated by different authors.

It is now generally agreed that infantile mortality rates following caesarean section conducted with modern anaesthetic techniques are statistically insignificant, when the foetus is at full term and no maternal or foetal complications are present. There is, however, statistically a significant variation in infantile mortality rate, when the foetus is premature and/or various maternal or foetal complications are present.[1] It was thus felt that an analysis of the results of anaesthesia for caesarean section at Baragwanath Hospital might prove of value, because 61% of all cases showed some degree of foetal distress, and 33% of maternal distress.

Our series consists of 747 mothers anaesthetized over the last 3½ years. There were 751 births (4 sets of twins). The first 231 cases were not fully documented. When this was realized more detailed notes were taken of the remaining 516. The figures for Table 4, therefore, were taken from these 516 cases, as were those for the incidence of foetal and maternal distress. The other figures quoted include all 747 cases.

The anaesthetics given were divided into the groups shown in Table 1:

Group 1 patients were given either nitrous oxide, oxygen and ether, cyclopropane or nitrous oxide, oxygen, Vinesthene and ether.

Group 2 patients were given one of the above together with small doses of Flaxedil or Tubarine and/or succinylcholine for intubation.

Group 3 patients were induced with a small dose of thiopentone and carried on the same anaesthetics as in Group 1.

Group 4 patients were induced with thiopentone and succinylcholine and intubated. Anaesthesia was maintained with light nitrous oxide, oxygen and ether or cyclopropane, in some cases combined with Flaxedil or Tubarine, or with nitrous oxide and oxygen with either Flaxedil or Tubarine and controlled respiration. In most cases we preferred to omit the longer-acting relaxants and to allow spontaneous respiration, thus freeing the anaesthetist to assist in the care of the baby.

Group 5 included both caudal and lumbar epidural blocks.

TABLE 1

1. Inhalation	223 cases
2. Inhalation + relaxant	145 cases
3. Thiopentone + inhalation	11 cases
4. Thiopentone + relaxant + inhalation	338 cases
5. Epidural	28 cases
6. Spinal	2 cases

It must be emphasized that the anaesthetics were administered by 20 different anaesthetists, who were at liberty to use the anaesthetic of their own choice, provided that there was adequate oxygenation of the patient and minimal depression of the foetus, i.e. as light a plane of anaesthesia as possible. The type of anaesthetic given was dictated by the preference of the anaesthetist and not the condition

of the patient. The incidence of foetal distress for each type of anaesthetic can be seen from Table 2.

TABLE 2

Inhalation	58%
Inhalation + relaxant	68·6%
Thiopentone + inhalation	54·5%
Thiopentone + relaxant + inhalation ..	59·7%
Epidural	63·6%
Spinal	100%

The slightly higher incidence of foetal distress in Group 2 is probably due to the fact that some of us at first hesitated to give thiopentone to very severely distressed infants. This qualm was discarded early in the series and nowadays the choice of the anaesthetic is not influenced by the condition of the baby. The same applies to the epidural class. At one stage we preferred to use epidural anaesthesia for very poor-risk babies. The spinal anaesthetics cannot be considered, as only 2 were done and they are included merely for completeness.

The various types of anaesthesia were compared in order to ascertain:

(*a*) The stillbirth and neonatal fatality rates;
(*b*) The depressant effects of the anaesthetic on the baby; and
(*c*) The maternal morbidity and mortality rates.

STILLBIRTH AND NEONATAL FATALITY RATES

Table 3 indicates that the stillbirth rate was considerably less for the thiopentone + relaxant + inhalation group than for either the pure inhalation or the inhalation + relaxant group (2.4% as against 4% and 4.1%). It was thought that this might not be a true

TABLE 3

	No. of Babies	*Still-births*	*Neonatal Deaths*
Inhalation	225	9	6
Inhalation + relaxant ..	147	6	7
Thiopentone + inhalation	11	2	—
Thiopentone + relaxant + inhalation	338	8	8
Epidural	28	1	2
Spinals	2	—	—

reflection, as some of the babies born alive died in the neonatal period; but, taking all foetal deaths, it would still appear that the mortality was lowest for the thiopentone + relaxant + inhalation series (4.7% as against 6.7% for inhalation and 8.8% for inhalation + relaxant). The figures for thiopentone + inhalation anaesthesia and for epidural anaesthesia are too small for statistical evaluation.

DEPRESSANT EFFECTS ON BABY

These were difficult to assess and it was decided to note the time between birth and the first cry. In the few cases where the baby did not cry in the theatre, the time from birth to regular satisfactory respirations was noted. It must be emphasized that, for our assessment, we were not satisfied with jerky, irregular, gasping breathing. Table 4 indicates the average interval between birth and the first cry in each group of cases.

TABLE 4

Inhalation	6·4 minutes
Inhalation + relaxant	5·5 minutes
Thiopentone + inhalation	5·2 minutes
Thiopentone + relaxant + inhalation	4·5 minutes
Epidural	1·0 minutes

Group 4 was further sub-divided as follows:

Thiopentone and succinylcholine + nitrous oxide, oxygen and ether, with or without Flaxedil or Tubarine ... ... 4.7 minutes
Thiopentone and succinylcholine + cyclopropane with or without Flaxedil or Tubarine ... ... 4.1 minutes
Thiopentone and succinylcholine + nitrous oxide and oxygen + Flaxedil or Tubarine and controlled respiration ... ... 4.1 minutes

At first we gave thiopentone only after the patient had been towelled and draped and the surgeon was ready to operate, in the belief that the baby could be delivered before the thiopentone had passed the placental barrier. The work of Cohen,[2] McKechnie[3] and Crawford[4] proved that the drug crossed the placental barrier in 45 seconds and that maternal and foetal levels reached equilibrium in 2–3 minutes, after which the levels fell synchronously. It was decided, therefore, that it was probably safer to allow some time to elapse between injection and delivery, as the foetal levels would be highest for the first few minutes after injection. Thereafter, we did not hurry the induction or the delivery.

We analysed these results by dividing our thiopentone cases into 2 classes:

1. Where the babies cried in under one minute;

2. Where the babies took more than one minute to cry.

There were 139 cases in Group 1 and 183 cases in Group 2. The average time between the thiopentone injection and the birth of the baby was 11.4 minutes for Group 1 and 12.4 minutes for Group 2. The average dose of thiopentone was 234 mg. for Group 1 and 264 mg. for Group 2.

MATERNAL MORTALITY AND MORBIDITY

Maternal Mortality. Three deaths occurred in which the patient did not recover from the anaesthetic.

Case No. 1. The patient had been in labour for 36 hours and caesarean section was performed for disproportion and maternal and foetal distress. She was given nitrous oxide, oxygen, Vinesthene and ether and intubated and then run on nitrous oxide and oxygen with Tubarine and controlled respiration. During induction there was spasm and cyanosis and also an episode of cyanosis during the operation. At the end of the operation she was apnoeic and blue and remained blue in spite of artificial ventilation. She died soon after operation. Post-mortem examination showed areas of atelactasis in the lungs with swelling and oedema of the bronchioles but no foreign material in the larynx or bronchi.

Case No. 2. The patient was a primapara aged 22 in good general condition. The caesarean section was undertaken for gross disproportion. She was given 1.3% Xylocaine in the sitting position between L 3 and 4. The blood pressure dropped within 3 minutes by 30 mm. Hg but was immediately restored by Methedrine; 45 minutes after the epidural was given there was a sudden collapse with cyanosis and cardiac arrest. Cardiac massage was immediately performed with recovery of blood pressure to the pre-operative level, but a state of decerebrate rigidity set in from which she did not recover and she died in this condition some months later.

Case No. 3. This was a case of gross disproportion who had been in labour for 60 hours, with a history of not having eaten for 20 hours. Vomiting occurred following induction with gas, oxygen, Vinesthene and ether. She was given 50 mg. of succinylcholine and intubated. During the operation a further 150 mg. of succinylcholine were given intermittently. At the end of the operation the breathing was shallow and jerky. One hour later she had a convulsion. In spite of inflation with oxygen, her colour remained poor and a bronchoscopy was performed. Fluid was sucked out of both bronchi but the heart stopped during bronchoscopy. At post-mortem examination the lungs were congested and contained unidentifiable foreign material.

There were 5 further deaths during the post-operative period:

Case No. 1 died 10 hours post-operatively from heart failure. At post-mortem examination she was found to have a very tight mitral with a poor myocardium. She had been given gas, oxygen, Vinesthene and ether followed by succinylcholine and intubated. Then she was carried on nitrous oxide and oxygen with Tubarine and controlled respiration. She gave no trouble during the anaesthetic and woke up on the table.

Case No. 2 died 24 hours post-operatively from a pulmonary embolus. She was operated on for disproportion and marked maternal distress, having been in labour for 19 hours. She had been given gas, oxygen, Vinesthene and ether with succinylcholine for intubation. The anaesthetic was uneventful and she awoke on the table.

Case No. 3 was operated on for gross disproportion with 2 previous caesarean sections. She, also, was given gas, oxygen, Vinesthene and ether with succinylcholine for intubation. The anaesthetic was uneventful, there being no vomiting or regurgitation and a stomach tube having been passed. Post-operatively she developed serious chest complications, with crepitations and rhonchi over both lungs and diminished air entry at the left base. The wound turned septic and she burst her abdomen and died on the tenth post-operative day.

Case No. 4 died on the sixth day from a pulmonary embolus. She had been operated on because of a prolapsed cord. The anaesthetic in this case had been thiopentone, succinylcholine, gas and oxygen and ether with a cuffed tube and had again been uneventful.

Case No. 5 had been operated on for disproportion and maternal and foetal distress. She was given thiopentone, succinylcholine, gas, oxygen and ether and the anaesthetic was uneventful, though the baby was stillborn. She died on the fifth day from a cerebral embolus.

Maternal Morbidity. A case was classified as having post-operative chest complications if she had a productive cough and a temperature, with or without physical signs. The analysis is shown in Table 5.

DISCUSSION

In reviewing our results it would appear that the overall foetal mortality is lower in our series when thiopentone and a relaxant were

TABLE 5

Anaesthetic	*Number of Cases*	*Post-operative Chest Complications*
Inhalation	225	24 or 10·7%
Inhalation + relaxant ..	147	23 or 15·6%
Thiopentone + inhalation ..	11	Nil
Thiopentone + relaxant + inhalation	338	41 or 12·1%
Epidural	28	3 or 10·7%

given with an inhalation anaesthetic than with any of the other forms of general anaesthesia. This is of interest because of the conflicting opinions on the use of thiopentone for caesarean section. Thus Collier[5] believes that the hazards of anaesthesia for caesarean section can be reduced by avoiding the use of the barbiturates. Bingham,[6] McKechnie *et al.*[3] and Crawford,[4] however, all advocate the opposite view. We feel with Crawford that the importance of this method of induction lies in the fact that it reduces the difficulties of induction to a minimum, and thus foetal oxygenation is maintained throughout anaesthesia, both because the mother does not have episodes of anoxia from a stormy induction and because lack of straining on the part of the mother avoids undue pressure on the placenta. This is of paramount importance in those cases where foetal distress is present. It is interesting that our results seem to confirm the findings of McKechnie and of Crawford that the time of delivery after the initial injection was of little consequence in relation to the degree of neo-natal depression. We have found that a dose of up to 250 mg. of thiopentone is safe, although we often use much smaller doses, but some workers have used up to 350 mg.[3, 6]

Our cases seemed to do equally well whether the thiopentone + succinylcholine induction was followed by gas, oxygen and ether, cyclopropane or nitrous oxide and relaxant. This is probably because these were given in small amounts and all had the same smooth rapid induction without struggling or anoxia.

From the maternal point of view, also, the thiopentone + succinylcholine series seem to be the safest, there being no maternal deaths attributable to this anaesthetic in 338 cases. On the other hand, 2 patients with a gas, oxygen, Vinesthene and ether induction, followed in Case 1 by Tubarine and controlled respiration, and in Case 3 by succinylcholine, died as a result of the anaesthetic. Case 3 definitely died from aspiration of vomitus and it is probable that in Case 1 also there was a certain amount of aspiration of acid gastric secretions leading to oedema and spasm of the bronchioles, even though at post-mortem examination no foreign material was found in the trachea or bronchi. At this point one might question the wisdom of giving a relaxant to a patient who is regurgitating, as the subsequent controlled respiration can serve only to drive the foreign material further into the bronchioles and the lungs.

We are always conscious of this danger of aspiration of stomach contents, as 96.6% of our cases were emergencies and the average duration of labour was 22 hours 42 minutes. It is a well-known fact that deaths from aspiration of stomach contents most commonly occur when caesarean section is carried out as an emergency procedure[7] and that the cases most at risk are the prolonged labours.[8] In the past we have tried to overcome this difficulty by passing stomach tubes before operation, but it is well known that this does not necessarily empty the stomach completely and, furthermore, the surgeon often objects to a stomach tube in cases of ante-partum haemorrhage, prolapsed cord or impending rupture of the uterus. In these cases we feel that a 'crash induction' with a small dose of thiopentone and succinylcholine, with the patient in the head-up position, and rapid intubation with a cuffed endotracheal tube, can do much to avoid the dangers of aspiration.

Thus, in our hands, it would appear that the thiopentone + relaxant + inhalation group gave the most satisfactory results of all the general anaesthetics from the mother's, the baby's and also the anaesthetist's point of view. For the latter many of the horrors of anaesthesia for caesarean sections have been largely eliminated by this method.

Of course it can be questioned whether conduction anaesthesia would not be preferable to general anaesthesia. It is generally agreed that local anaesthesia is safest for the mother and baby.[9, 10] We have very little experience of this technique, as also of spinal anaesthesia, and cannot venture an opinion.

Epidural anaesthesia was, however, used by us on a number of occasions. We found it remarkably good for the babies—all babies crying within an average of one minute. There was one stillbirth, but this cannot be attributed to the anaesthetic, as the baby was badly deformed and it is doubtful whether it was alive before birth. However, of the 2 neonatal deaths one, at least, can be attributed to the anaesthetic. In this case there was marked foetal distress before birth. The mother's blood

pressure fell to 60 mm. Hg systolic, after the anaesthetic had been given, and although this was soon controlled with Methedrine, this period of anoxia may have turned the scales against the baby. It was born blue and, although gasping, died about an hour later.

The blood pressure drop on the average was 30 mm. Hg and was readily controlled by small doses of Methedrine.

Vomiting occurred in 3 of the 28 cases. This can be very disturbing both to the surgeon and to the patient.

The main disadvantage of epidural block was, that it took longer to perform than a general anaesthetic and was not always successful. Out of 32 attempted epidurals only 28 were successful, the others having to be given a general anaesthetic, a failure rate of 12½%, which could probably be considerably reduced with more experience. Gordon *et al.*[11] quote a failure rate of 5%.

We had one maternal death in our series which, we feel, should have been avoidable. It may have been a case of delayed spinal block[12] but, nevertheless, the outcome might have been different if the patient had been more carefully watched, and certain fundamental precautions taken. The same factors apply to epidural as to spinal analgesia, viz. paralysis of the intercostal muscles and diaphragmatic dysfunction. If this patient had been given oxygen, as advocated by McIntosh,[13] and the collapse had been noticed earlier, she might have survived.

The number of epidural anaesthetics reported in this series is too small for any definite conclusions to be drawn, but we feel this method merits further investigation.

SUMMARY AND CONCLUSIONS

1. Seven hundred and forty-seven cases of anaesthesia for caesarean section are analysed.

2. From the point of view of the mother and the infant thiopentone, succinylcholine and inhalation anaesthesia offered the best results of all the general anaesthetics in this series.

3. The cases given epidural anaesthesia are discussed briefly and it is suggested that this method should be further investigated.

OPSOMMING

1. Sewehonderd-sewe-en-veertig gevalle van anestesie vir 'n keisersnee word ontleed.

2. Uit die standpunt van die moeder en die suigeling het tiopentoon, suksinielcholien en inasemingsanestesie beter resultate as enige van die ander narkosemiddels in hierdie reeks opgelewer.

3. Die gevalle wat epidurale anestesie gekry het, word kortliks bespreek, en daar word aan die hand gedoen dat nadere ondersoek na hierdie metode ingestel behoort te word.

We wish to thank Drs. Lavery and Evans for permission to report on the anaesthetics administered to their patients. We thank also all members of the Obstetrical Department of Baragwanath for their help and co-operation in carrying out this investigation.

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RADIOLOGICAL ASPECTS OF SIGMOID VOLVULUS IN THE BANTU

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Volvulus of the sigmoid colon is commoner in the Bantu than in the European.[1] The mortality rate for all series is high, varying from 30%[2] to 60%.[3] The lesion is serious because it is difficult to diagnose clinically, it is not relieved by the usual methods of intubation, suction or even caecostomy, and because delay will result in strangulation.[4] Thus it is imperative to make an early diagnosis and in this respect radiology plays a major role. In an attempt to assess its contribution, an analysis was made of the radiographs of 13 cases of volvulus of the sigmoid, proved at operation.

Material. The series comprised 13 patients, operated upon at Baragwanath Hospital during the last 5 years, and of whom 4 died. There

TABLE 1

Case	Duration of Symptoms (Hours)	Sigmoid Loop		Width (cm.)	Width of Rest of Colon (cm.)			Non-Distended Bowel		Area Free of Gas	Fluid Levels Sigmoid		Other Fluid Levels			Operation Findings (SV: Sigmoid Volvulus)
		Position	Number of Parts		Caecum Ascending Colon	Transverse Colon	Descending Colon	Gas in Small Bowel	Gas in Rectum		Number	Width (cm.)	Position	Number	Width (cm.)	
1	11	R.H.	2	10 10	7	6	4	Yes	Yes	Below SF.	2	7 8	C. St.	1 1	2 5	SV with clockwise twist.
2	18	Both hypochondria	2	8 10	8 (C) 7 (AC)	7	5	No	Yes	Below S.	2	9 9	DC.	1	4	Grossly distended SV. Patient died 1 week later.
3	18	Mid-abdomen and R.H.	2	9 9	8 (C) 6 (AC)	5	4	No	Yes	Below DC.	2	8 9	C.St.	1 1	5 4	Large SV. Easily reduced.
4	24	R.H.	2	10 10	7	6	5	No	No	Below SF.	2	10 10	C. AC. S.F.	1 1 1	7 3 8	Enormous loop of strangulated SV. Patient died.
5	24	Just to right of midline	2	8 8	6 (C) 5 (AC)	5	4	No	Yes	Nil	2	8 8	DC; St.	1 1	6 7	Large distended SV in anti-clockwise twist.
6	48	RH.	2	18 16	5	3	4	No	Yes	Nil	2	8 6	C; DC; St.	1 1 1	7 4 6	SV rotated 180° anti-clockwise. Megacolon present.
7	48	Just to right of midline	2	6 6	8	8	8	No	No	DC.	2	5 5	St.	1	6	SV with grossly dilated colon. Patient died.
8	48	L.H.	2	8 8	8	5	5	No	Yes	HF.	2	4 4	TC. DC. St.	1 1 1	6 5 9	SV with grossly dilated colon. Patient died.
9	72	L.H.	2	10 9	5	5	5	Yes	Yes	Nil	2	8 6	C. DC. Small bowel	1 1 5	8 6 2–4	SV through a congenital opening of mesentery of distended small bowel.
10	96	L.H.	2	6 6	6	6	6	No	Yes	Below DC.	2	6 6	DC.	1	5	SV with distention of rest of large bowel.
11	100	L.H.	2	5 5	10	7	7	Yes	Yes	Nil	2	5 4	C. Small Bowel	1 3	6 2–4	SV with small and large bowel distention and free fluid. Patient died.
12	100	Both hypochondria	2	5 5	4	5	5	No	Yes	Nil	2	5 6	C. Small bowel DC.	1 7 2	8 1–4 3	SV distended small and large bowel. Megacolon. Patient aged 5.
13	100	Both hypochondria	2	10 10	6	8	8	No	Yes	Nil	2	7 7	C. St.	1 1	5 6	Redundant sigmoid twisted into SV by thick adhesions.

AC: Ascending Colon.
C: Caecum.
DC: Descending Colon.
HF: Hepatic Flexure.
LH: Left Hypochondrium.
RH: Right Hypochondrium.
S: Sigmoid.
SF: Splenic Flexure.
St: Stomach.

were 12 males and 1 female, with ages ranging from 5 to 93 years, most of the patients being in the 20–40 group. The duration of symptoms at the time of radiography was less than 24 hours in 5, and in the remainder less than 100 hours. The first group would therefore be classified as acute and the second as subacute.[5] All the patients had radiographs of the abdomen taken in the supine and erect positions. No enema was given before the examination, in order to prevent the formation of false fluid levels.[6]

The Supine Film. This shows the distribution of gas in the bowel. In acute distension the upper small bowel shows a regular and complete cross-hatching from the shadows of the stretched plicae. The ileum has almost no signs of plicae, while the colon presents an outline retaining some trace of haustration, the plicae being incomplete and tending to interdigitate.[7] We have found it useful to do both antero-posterior and lateral films, especially when it is uncertain whether gas in the pelvis is in the lower small bowel or the rectum. If the gas in the lateral film is lying posteriorly in front of the sacrum, it is most likely to be in the rectum.

The Erect Film. This is taken primarily to demonstrate fluid levels. These are commonly seen in the normal subject in the stomach, duodenal bulb, flexures of the colon and in the haustral pockets of the ascending and transverse colon when its contents are liquid.[7] In the presence of intestinal obstruction the gas (70% of which is swallowed air) is first arrested at the site of obstruction and then the fluid is poured out, taking longer to accumulate.[6] This distention occurs earlier than do the fluid levels. The erect film will also show the presence of free gas under the diaphragm in the event of a ruptured hollow viscus.

The results of the analysis are shown in Table 1.

Figs. 1 and 2 (Case 2) show the typical picture of sigmoid volvulus as seen in the supine and erect positions.

DISCUSSION

From these observations a clear-cut radiological picture emerges. All the patients show a distended loop of sigmoid consisting of 2 equally dilated parts, each with a fluid level. This loop lies with its apex in either or in both the hypochondria. The rest of the large bowel proximal to the obstruction is dilated, with the greatest dilation in the caecum. Gas is usually present in the rectum, probably as a result of an intermittent or incomplete obstruction, and it is unusual to find gas in the small bowel. When it is present, there is presumably some degree of ileo-caecal valvular incompetence. The area of the pelvic colon is sometimes devoid of gas. Fluid levels other than in the obstructed loop itself are, on the whole, not common and the fluid levels in the volvulus are always the broadest.

The presence of a distended coil of large bowel, consisting of 2 uniformly expanded parts, is said by Bellini[8] to be diagnostic of sigmoid volvulus. However, we have seen a similar appearance in left lower lobe pneumonia that had presented as an intestinal obstruction, but which had no fluid levels in the erect film. Both Nelson and Bowers[4] and Rigler[9] stress that the presence of a double fluid level in a greatly distended loop is virtually pathognomonic of a sigmoid volvulus, especially when there is a relatively moderate distension of the rest of the colon. Our findings agree with this but Ritvo and Golden[10] maintain that even if the plain films show the above appearances, they only indicate that obstruction is present and that it is most probably in the lower portion of the colon, without determining exactly the site or nature of the lesion. He therefore advocates the use of a barium enema in these cases. In the presence of complete obstruction an 'ace of spades' or bird-beak deformity is present; and, if incomplete, a corkscrew arrangement in the volvulus is produced at the site of twist. This investigation has even been used as a therapeutic measure in non-operative reduction of the volvulus.[11-13] However, it is claimed[4,9] that a barium enema is frequently of little value because the serious condition of the patient, often accompanied by total inability to retain the enema, makes the procedure difficult. Furthermore, the distended overlapping loops of gas-filled bowel militate against accurate interpretation. There is also the undesirability of passing large quantities of barium beyond the site of the lesion and the danger of overdistending a bowel which is already necrotic. The ability to force barium to the caecum does not eliminate the possibility of a volvulus, as in such cases a valve type of mechanism may allow a passage of barium but may prevent its return. None of our patients had a barium enema pre-operatively, but it is important to do so a reasonable time after the obstruction has been relieved in order to try to find the cause. Thus 2 of our cases with redundant sigmoids and 2 with megacolon were subjected to further surgery and considerably relieved.

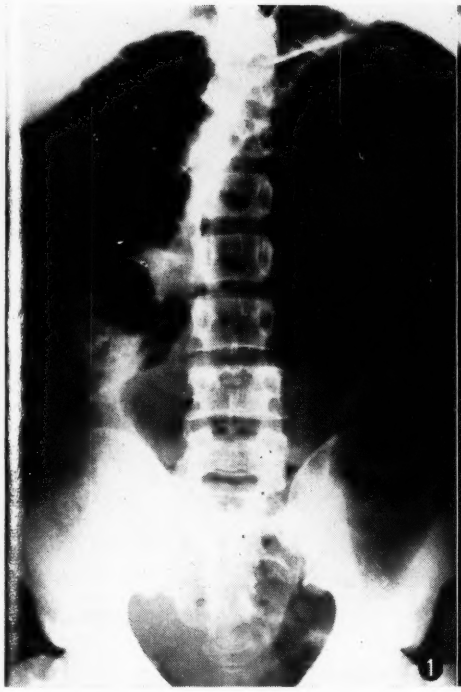

Fig. 1. Supine film of abdomen showing grossly distended loops of sigmoid lying in the right and left hypochondria.

Fig. 2. Erect film of abdomen demonstrating broad fluid levels in the sigmoid loop (horizontal arrows), and a smaller fluid level in the descending colon (vertical arrow).

DIFFERENTIAL DIAGNOSIS

1. *Neoplasm* of the left side of the colon may cause obstruction and in these cases the ascending and the descending colon are dilated to a different degree with maximal dilatation in the caecum, unlike the uniform dilatation in the 2 parts of the sigmoid loop. However, a double lesion the left colon may be difficult to differentiate and, in this type of case, a barium enema may be of great help.

2. Patients with *megacolon,* while not completely obstructed, may show distension of the sigmoid with large amounts of gas. In such circumstances the whole colon is distended, but megacolon is more prone to undergo volvulus than is a normal colon[12] (as seen in Cases 6 and 12), and both conditions may be present together.

3. *Volvulus of the caecum* usually shows a distended single coil, often semi-circular in shape, and varying in position. One of our cases showed the distended loop in mid-abdomen, another had the loop in the left hypochondrium and the third in the right iliac fossa. All 3 showed a single broad fluid level and considerable distension in the small bowel.

SUMMARY

1. The radiological findings in 13 cases of volvulus of the sigmoid colon in the Bantu are analysed.

2. All cases showed a distended sigmoid loop consisting of 2 parts, each being uniformly dilated with a fluid level. This finding is therefore very suggestive of a sigmoid volvulus.

3. The advisability of barium enema examination in these cases is discussed.

OPSOMMING

1. Die radiologiese bevindings in 13 gevalle van volvulus van die S-vormige dikderm by Bantoes word ontleed.

2. Al die gevalle het 'n opgeswelde S-vormige lis getoon. Dit het uit 2 dele bestaan, albei waarvan eenvormig met 'n vloeistofpeil verwyd was. Hierdie bevinding laat derhalwe sterk aan 'n S-vormige volvulus dink.

3. Die raadsaamheid van 'n barium-lawement-ondersoek in sulke gevalle word bespreek.

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DERMATOLOGICAL LESIONS IN THE BANTU

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The following illustrations depict some of the common skin diseases met with in the African as observed at Baragwanath Hospital.

A. BACTERIAL DISEASES

(*a*) *Leprosy* (*Figs.* 1 *and* 2). Numerous cases are seen at Baragwanath Hospital every year. All cases were transferred to Westfort Leper Institution, Pretoria.

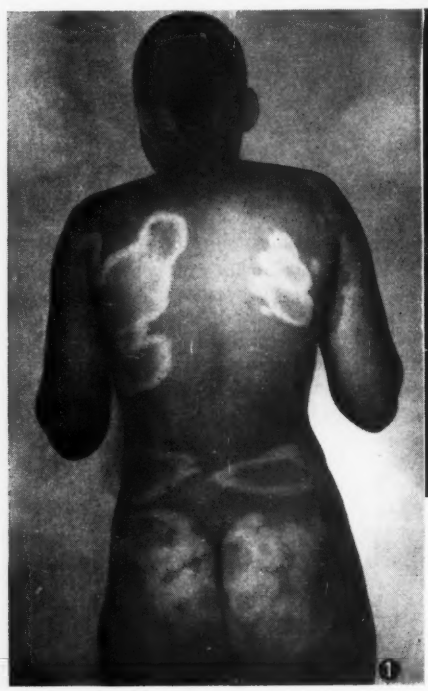
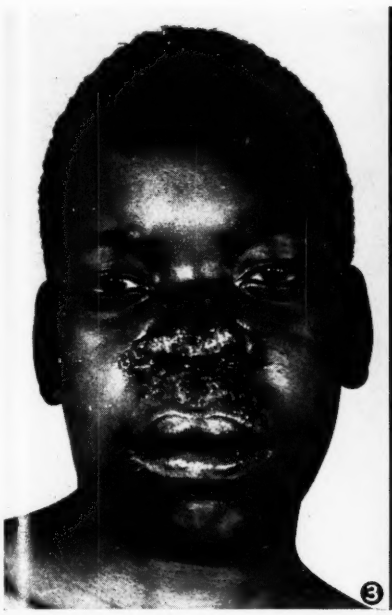


Fig. 1. Leprosy.
Macules were also present on trunk and arms in Fig. 2.



(*b*) ***Lupus Vulgaris*** (*Fig.* 3).
This disease is common in the Bantu whereas it is practically unknown among Europeans in Southern Africa.
Response to Isoniazid with or without streptomycin is excellent.

(*c*) *Diphtheritic Ulcers* (*Fig.* 4). Note typical round punched out ulcers covered with a gray slough. Treatment is with antidiphtheritic serum and penicillin given systemically.

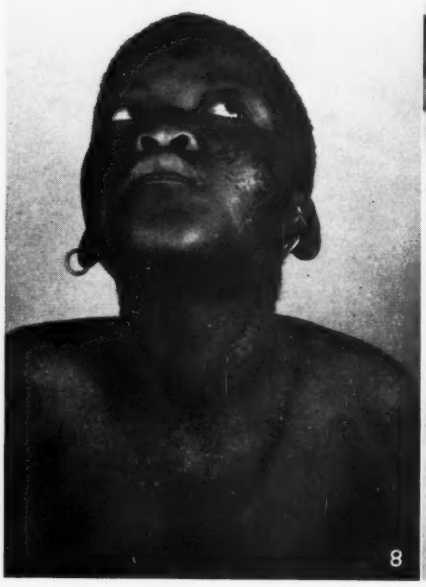
B. FUNGAL DISEASES

(*a*) *Sporotrichosis* (*Fig.* 5). This is seen fairly frequently in mine workers and garden boys. Lesions are mainly on hands and feet. It responds to prolonged therapy with penicillin and larger doses of Potassium Iodide.
Fig. 5A. An unusual involvement of the face.

(*b*) *Chromoblastomycosis* (*Fig.* 6). The only treatment for this condition is with X-ray therapy.

(*c*) *Tinea Imbricata* (*Fig.* 7). There is a characteristic stencilled appearance of the lesions.

C. DEFICIENCY DISEASES



Pellagra (*Figs.* 8 *and* 9). Note collarette in Fig. 8.

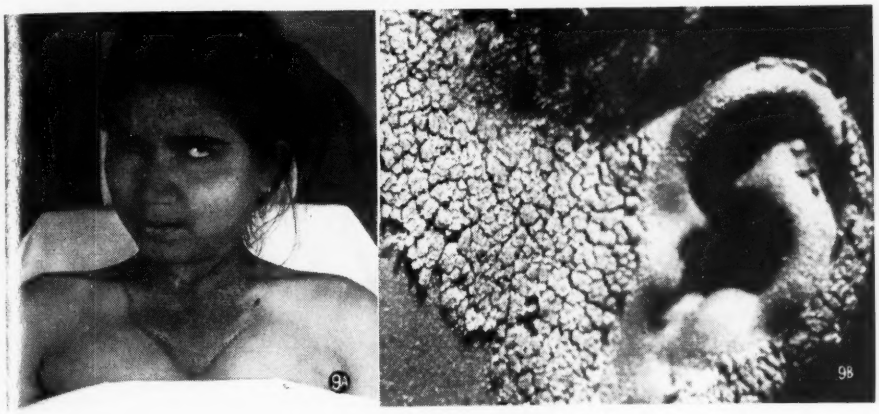
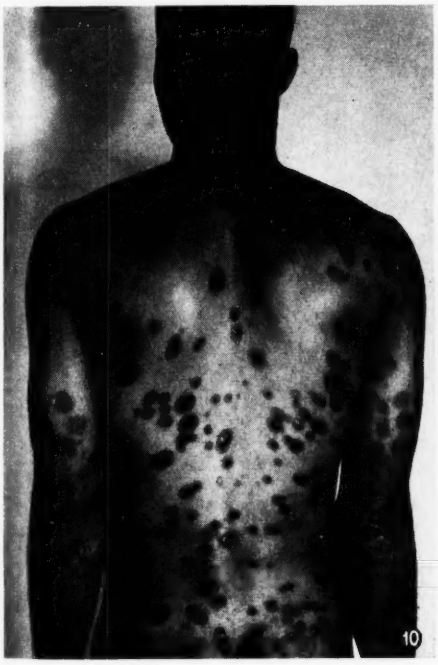


Fig. 9A. Pellagra in an Indian female.
Fig. 9B. Vitamin A deficiency. Originally regarded as a pityriasis rubra pilaris. There was a rapid and complete response to vitamin A treatment.

D. PHENOLPHTHALEIN DRUG ERUPTION (FIG. 10)

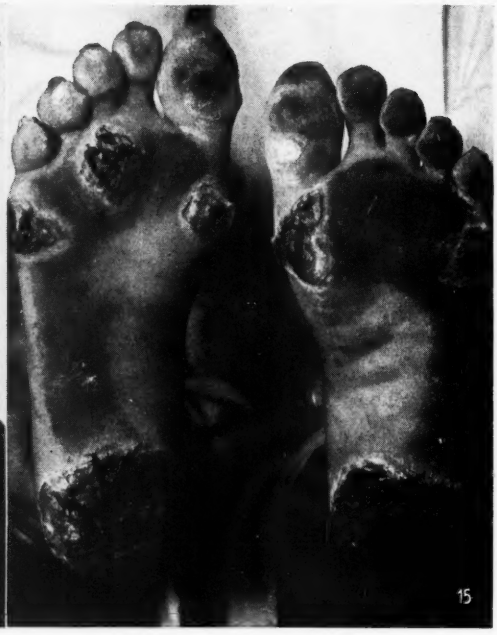


This is the commonest cause of drug eruptions. Phenolphthalein is a constituent of more than 100 different purgatives.

E. MISCELLANEOUS CONDITIONS

(*a*) *Dermatomyositis* (*Fig.* 11).

(*b*) *Chronic Discoid Lupus Erythematosus* (*Figs.* 12, 13 *and* 14). Very common in the African.



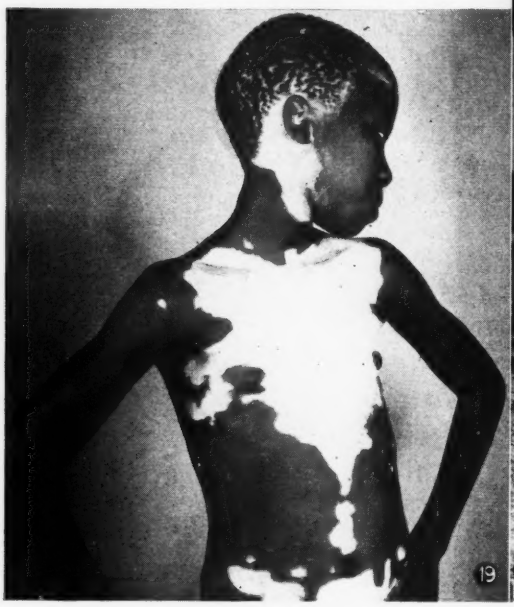
(*c*) *Plantar Callosities* (*Fig.* 15). This is one of the most disabling conditions found in the Bantu. Literally hundreds of Africans are immobilized by it and unable to earn a living. Treatment is unsatisfactory and the true aetiology of the condition remains unknown. Callosities must not be confused with plantar warts, which are rare in the Bantu.

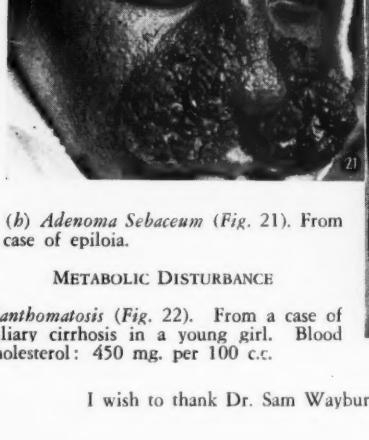
(*d*) *Kaposi's Haemangiosarcoma* (*Fig.* 16).

(*e*) *Xeroderma Pigmentosa* (*Figs.* 17 *and* 18). A rare condition. Only 3 cases have been seen at this Hospital in 10 years.

(*f*) *Vitiligo* (*Fig.* 19). Painting with Meladenin is sometimes successful in restoring pigment in Coloured and Indian children, but never in the Bantu.

(*g*) *Dermatitis Artefacta* (*Fig.* 20). This patient was hospitalized for more than a year outside the Union. The lesions were self-inflicted. Note the parallel scars which gave the clue to the diagnosis.

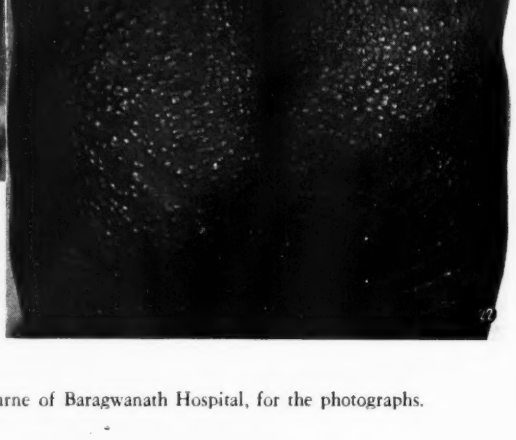




(*h*) *Adenoma Sebaceum* (*Fig.* 21). From a case of epiloia.

METABOLIC DISTURBANCE

Xanthomatosis (*Fig.* 22). From a case of biliary cirrhosis in a young girl. Blood cholesterol: 450 mg. per 100 c.c.



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NURSING SERVICES AT THE BARAGWANATH HOSPITAL

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The story of Baragwanath Hospital would not be complete without a review of the growth of the nursing service within the hospital over the past 10 years. Dr. Frack has pointed with justifiable pride to the contribution made by the medical staff of this hospital in the development of medical science. In considering this we should remember that the tremendous task of nursing our many patients with their diversity of disease and injury, and meeting the needs of the doctors, has been carried out by a nursing force almost entirely non-European.

In 1940 the non-European Hospital, Johannesburg, with a student strength of 72, began training non-European nurses for registration with the South African Medical Council. At that time there was not a single trained non-European nurse on the staff of the hospital. The wards were under the supervision of European sisters, staff nurses and, even, student nurses. The first 3 non-European staff nurses were appointed on 1 April 1942. The first non-European ward sister was appointed on 1 January 1948, only 4 months before Baragwanath Hospital was opened. To-day Baragwanath Hospital, the successor to the non-European Hospital, has posts for 3 non-European matrons, 32 sisters and 251 staff nurses. The only European nursing staff remaining are in the capacity of administrative or supervisory matrons or as teaching staff. They total at present 25. There are 9 vacant posts, 8 of these vacancies being for sister tutors.

With the opening of Baragwanath Hospital there was a sudden expansion of non-European hospital beds from 400 to almost 1,200, without a corresponding increase in the number of European nursing staff. Never at any time, until they were withdrawn, did the number of European sisters employed in the hospital exceed half the number of the authorized establishment. Thus, from the very beginning, the

main burden of caring for the sick has fallen on the shoulders of the non-European staff. The tremendous increase in the population in the areas surrounding the hospital, where houses are being built at the rate of 40 a day, has caused increasing pressure on the resources of the hospital. Only the most serious cases are admitted and they are discharged earlier than would be the case in other hospitals where the demand for beds is not so great. Since 1949 the average length of stay has been halved. In spite, however, of the rapid turnover, and the premature discharge of patients, the death rate in the hospital has not changed materially. Table 1 demonstrates the increased tempo of work in the hospital.

TABLE 1

	1949	1953	1957
*Bed state	1,120	1,419	1,363
Daily average admissions	61·2	67·7	82
Surgical operations ..	8,890	10,826	13,895
Casualty and Out-Patient attendances	148,769	320,564	396,422
Average length of patient's stay (in days) ..	17·6	17·3	9·9
Death rate	7%	7·2%	7·3%

*(Midwifery beds are not included).

It can be judged then that a safe standard of patient care has been maintained by the nursing staff, in spite of the many and varied difficulties that confront them.

When Baragwanath Hospital opened the student strength was 180. To-day there are almost 500 student nurses in training, and another 240 students pass annually through the Pre-Nursing School to enter this hospital for training after selection. It is the largest training school for non-European nurses in the Union, and probably in Africa.

In view of the highly specialized nature of the health services now being rendered, and the increasing maturity in outlook and responsibility of the non-European staff, the stage has now been reached where serious and immediate attention must be given to the post-graduate training of the non-European nurse. Facilities for this are limited. So far the only post-graduate courses offered are midwifery and the Health Visitors and School Nurses' Course and, in this hospital, radiography. The Transvaal Provincial Administration and the Board of this hospital are deeply concerned about this paucity of training facilities and are in the process of promoting schemes whereby this hospital will become one of the main post-graduate training centres for the non-European nurse. To further this object, plans have already been drawn for considerable extensions to the Nursing College.

The field of post-graduate study is wide and courses are contemplated for implementation as soon as possible in midwifery, operating theatre technique, paediatrics, orthopaedic nursing, dietetics and district nursing. But the first course that is likely to be established, we hope in July 1958, is for the training of sister tutors. There is an acute shortage of tutors throughout the country, and a grave danger that much of the progress that has been so painstakingly made over the last few years in the training of non-European nurses may be nullified unless this shortage can be rapidly overcome.

In order to assist the ward sisters and staff nurses in their onerous duties of administering heavy wards, caring for the sick and training student nurses, a course in Clinical Administration and Instruction is to be instituted shortly. A short pilot scheme of this nature was conducted some time ago in the hospital and proved to be highly stimulating and of benefit to all those taking part in it.

The non-European nursing staff are to be congratulated on the progress they have made in the 10 years of this hospital's existence. Their further development will be watched with interest and sympathy by all those who labour with them to enable Baragwanath Hospital to develop into an institution universally recognized for the high standard of nursing care it gives to the community it serves.

OPSOMMING

Die verhaal van die ontwikkeling van die Baragwanath-hospitaal is onafskeidelik verbonde aan die verhaal van die ontwikkeling van nie-blanke verpleegwerk in Johannesburg. Die verpleegpersoneel by hierdie groot hospitaal met sy 1,600 beddens bestaan byna geheel en al uit nie-blankes. Toe die hospitaal in 1948 geopen is, was daar 180 nie-blanke leerlingverpleegsters in die personeel. Daar was slegs 'n enkele nie-blanke suster. Vandag is daar betrekkings vir 3 nie-blanke matrones, 32 saalsusters en 251 stafverpleegsters.

Die nie-blanke personeel het vandag 'n veel ryper uitkyk op sake en hul verantwoordelikheidsgevoel neem geleidelik toe. Gevolglik het die tyd vir die administrasie aangebreek om minder aandag te bestee aan die opleiding van leerlingverpleegsters—wat reeds 'n vaste instelling geword het—en oorweging aan die na-graadse opleiding van verpleegsters te verleen. Kursusse in verloskunde, operasiesaal-tegniek, kindergeneeskunde, ortopediese verpleging en

dieetkunde word reeds oorweeg. Daar is 'n ernstige tekort dwarsdeur die land aan susterdosente, en daar word gehoop dat dit in Julie 1958 moontlik sal wees om met 'n kursus vir die opleiding van sodanige dosente te begin. Vir saalsusters en stafverpleegsters sal 'n kursus in Kliniese Administrasie en Opleiding eersdaags ingestel word.

Die nie-blanke personeel het in die afgelope 10 jaar merkwaardige vordering gemaak, en hul toekomstige vooruitgang sal met belangstelling en simpatie dopgehou word. Sonder hul bydraes sou die mediese prestasies van die hospitaal wat met soveel trots geboekstaaf word, nie moontlik gewees het nie.

AFRICAN NURSE TRAINING—TEN YEARS OF PROGRESS

E. W. PETERSEN, R.M.S.N., R.M., SISTER TUTOR DIP. (LOND.)
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To lighten the darkness of ill health over Africa is the wide vision which Baragwanath Hospital has for its nurses. This is depicted in its badge which shows a radiant lamp, the symbol of Nursing, casting light over the whole continent. This can be true if all service given in this great Hospital springs from a real desire to serve the sick with kindness and gentleness, as well as with efficiency and good organization. The principles underlying medical and nursing care were in essence spiritual before they became scientific. Now the danger of losing the qualities of the spirit are apparent as science develops. A union of the two will bring light and hope to Africa.

THE HOSPITAL

Origin. Baragwanath Hospital, celebrating its 10th birthday as a non-European hospital under the Transvaal Provincial Administration, was built during the Second World War to treat the men of the British Forces who contracted pulmonary tuberculosis while serving in the Middle and Far East.

Position. It lies some 7 miles outside Johannesburg, within sight of the sea of small tin-roofed homes which house the vast African population (305,085 in 1956) which it serves. This area grows at the rate of 40 houses a day as the Housing Division of the Johannesburg Municipality replaces the dark shacks of tin and mud which grew up as squatter's camps built by the thousands of country people who flocked to *Egoli,* and became the homeless of a city unprepared for their coming. These huddles of shacks and other overcrowded slums have contributed to the high incidence of disease, and to the crime which ends in violence, which helps to fill the wards of this Hospital.

The Baragwanath buildings, single storied and pavilion type, are unimpressive except in their extent, and in the length of the connecting corridors which link its 46 wards, with a bed state of 1,600.

The Tempo of Work. As the townships grow so does the pressure of work increase and in the 10 years since the Hospital opened there has been almost 100% increase in all its activities.

	17 September 1948	1 January 1958
Bed State	1,075	1,594
Daily Average Admissions	55	108.6 (1957: 39,631)
Daily Average Operations	20	46
Casualty and O.P.D. Attendances Daily	200	994.8

The Society Served. It is difficult to indicate the health challenge offered by the surrounding population. The following indices are, however, of interest:

The incidence of pulmonary tuberculosis is 13.9 times as great in this population as in the White population of Johannesburg and the death rate 8.8 times as great.

The infantile mortality rate which has shown the dramatic fall from 496.61 per 1,000 in 1940–41 to 142.24 in 1956 still remains 5.2 times as great as that of White babies in Johannesburg.

These figures are important to the African nurse, for this is her challenge. This is the society she comes from, and the society she is being trained to serve. She is in the front line of health instructors for this community, particularly with the growth of the district nursing and clinic services which are envisaged for the future, and which have already begun in the large Polyclinic at Meadowlands which comes under control of Baragwanath Hospital. She can also play a vital part in the reduction of the scourge of malnutrition which affects such a large proportion of her people.

African Nurses Assume Responsibility. During the 10-year period (and particularly during the past 5 years) a steadily increasing amount of responsibility has been taken by the trained African nursing staff at the high professional level of Ward Sisters and Charge Staff-Nurses (Table 1):

At the time of the withdrawal of the last of the White Ward Sisters from the wards,

the hospital was divided into 4 sections (10 wards and about 400 patients in each) and each section placed under the supervision of a White Clinical Matron.

Increased Stress. The withdrawal of the group of highly experienced Ward Sisters and their replacement by newly appointed and therefore less experienced Ward Sisters coincided with a period of increasing stress. This

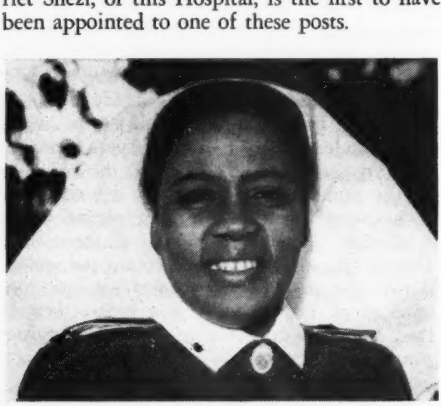
TABLE 1

	June 1953	*November 1954*	*January 1958*
White Ward Sisters	23	9	—
African Ward Sisters	6	11	29
African Staff Nurses	144	195	205

was partly due to a rising admission rate with the resultant higher bed-occupancy rate, and a much more rapid turnover of patients. This high admission rate has frequently assumed the proportions of crisis.

Standards Maintained. That the hospital has continued to run with no apparent signs of deterioration in the standards of nursing, and with an improving pass-rate amongst student nurses, is evidence of a high degree of responsibility and stability amongst the nursing staff as a whole, and the trained staff in particular. This is one of the most encouraging signs for the future of African nursing in South Africa.

Confidence Maintained. The confidence of the Transvaal Provincial Administration in the ability of the Ward Sisters is shown by the recent establishment of 12 posts of Clinical Matron for non-European nurses. Miss Harriet Shezi, of this Hospital, is the first to have been appointed to one of these posts.



Miss Harriet Shezi

Résumé of Functions. The function of Baragwanath Hospital must be seen therefore as following broadly under 3 headings:

1. As a hospital, an out-patient service for the needs of nearly 400,000 persons.
2. As a centre of medical research, the importance and scope of which is described in the rest of this publication.
3. As one of the largest centres of nurse education for African girls in the continent.

It is in this latter aspect that an evaluation will now be attempted.

AFRICAN NURSE TRAINING

In South Africa the training of African nurses began in a very small way in 1903 when 2 Africans began training at the Victoria Hospital in Lovedale, Cape Province. Nurse Cecilia Makiwane who gained the Certificate of the Cape Colony Medical Council in 1907 became the first registered non-European nurse in South Africa.

Until 1930 very few African nurses qualified for registration; most were being trained for hospital certificates. From 1931 all nurses training at the Lovedale Hospital were prepared for the examinations of the Medical Council.

Other Mission hospitals followed the lead of Lovedale. The McCord Hospital in Durban trained for state registration from 1924 and other schools opened for midwifery.

In 1939 Pretoria Hospital in the Transvaal became a registered training school for Africans and in 1940 the non-European Hospital in Johannesburg followed this lead.[1]

In 1948 the non-European Hospital transferred to Baragwanath Hospital and a Nursing College to serve and train students of both Baragwanath Hospital and Coronation Hospital (a neighbouring hospital with 400 beds and approximately 170 students) was opened.

At that time (1948) there were about 1,646 non-European Student Nurses in the Union; at the end of 1957 there were 2,673.

Nurse education for African girls is thus new enough to be exciting and sometimes unpredictable, yet old enough to have borne fruit, the quality of which can be assessed critically. It presents profound challenges and produces deep satisfactions. Precedents are being established which may aid other peoples who similarly have not yet realized their full potential; yet these have not yet crystallized into the rigidity of tradition and convention.

In order to understand the challenges and appreciate the achievement something of the background of these students should be known.

THE STUDENTS

Their Diversity. About 95% are of Bantu origin. The rest consist of Coloured girls (of mixed ancestry) and a few Indians; these latter groups are too small to be dealt with separately in this discussion.

The students, whose homes are in the 4 Provinces of the Union and Basutoland, come from the 4 main linguistic groups:

The major Nguni group (consisting of the large sub-group of Zulu, Xhosa, Swazi and Ndebele);

The Sotho group (containing the major sub-groups of Northern and Southern Sotho and Tswana); and finally

The 2 smaller major groups of Tsonga and Venda.[2]

All these groups speak different languages and within each group are numerous divisions into clans with different dialects. This diversity is further complicated by the horizontal division which traverses all groups and divides further into rural or city bred. Of 160 students in a survey, 50 were classified as country-bred and 110 as town-bred. In small country towns, however, the quality of life is rural, so the division is probably nearer half and half.

This diverse background complicates the adjustments a new student must make. Not only must she adjust to the highly exacting professional and ethical standards of a hospital environment (adjustment to this environment often overtaxes the ability of a White girl) but she must, in addition, learn to accept the alien ways and clashing beliefs of others of her own race.

If the ability to adjust to new situations is a factor of intelligence, then the fact that these difficult adjustments are made with so little discernible signs of stress must indicate an endowment to a high degree with this particular factor.

Their Unity. There are many common factors which forge bonds between the students:

(*a*) *Motivation*: All are strongly motivated in their desire to succeed in nursing, which is one of the only two professions open in large numbers to African women. The other is teaching. The Matron of Baragwanath Hospital receives between 2,000–3,000 applications yearly for 250–300 vacancies for student nurses. Most of these are rejected because of inadequate education.

They have possibly never analysed their motives but a questionnaire given to 35 students in which they were asked to give 4 reasons (if possible) for choosing nursing, produced answers which fell into the following categories:

Altruistic reasons received 63 mentions, being composed of:

A desire to help the sick (34);

A desire to raise their race or nation (25), and religious reasons (4).

A desire for an increase in status received 43 mentions being composed of:

A desire for further education (19);

A desire for professional prestige (12); and

A desire for good wages and security (12).

Sixteen other miscellaneous reasons were listed.

(*b*) *Christianity*: Another bond of unity is that of Christian belief. In a group of 27 students 26 had been baptised as infants in a Christian Church and one was a Hindu. In this connexion it is interesting to note that the supposition that races other than one's own have only a 'nominal' belief is apparently true of all peoples. An African student nurse writing her first impressions said of a Sister Tutor: 'At least she is a Christian and this is rather rare amongst White people.'

(*c*) *Dislocation of Family Life*: If stability of family life breeds stability of character then a large number of African nurses share a grave disability. Of 32 girls questioned only 18 had both parents alive, 4 were orphans, and 10 had lost one parent (9 fathers were 'dead' and 1 mother). Seventeen had been brought up by persons 'other than parents' for more than 2 years (average 8 years). Eight grandmothers and 9 'aunts' or 'uncles' had given this substitute care.

There is probably less deprivation suffered by these children due to the strong kinship bonds of African people, but nevertheless this instability is probably a handicapping factor.

(*d*) *Linguistic Ability*: There appears to be a high degree of linguistic ability if the following statements are accepted without being verified by examination:

Number of languages	6:5:4: 3:2:1
Number of students with ability to speak	2:5:5:10:5:–
Number of students with ability to read and write	–:2:3:15:7:–

(Those who mentioned a 'little ability' were excluded.)

In spite of this linguistic ability, it is obvious to teachers in the Nursing College that an incomplete command of the language of instruction is the most basic disability. This has necessitated, more than any other factor, the institution of a Pre-Nursing Course.

It is important that as many potential nurses as possible take their Junior Certificate Examination (the minimum standard of education required of student nurses) with one of the official languages at the A grade. The assurance given by members of the Department of Bantu Education that the number of scholars

doing this (particularly in English) is increasing is encouraging.

This command of a Western or European language is the tenuous bridge between the old traditional forms of thought and the progressive ideas of a scientific age. To cross this bridge means to acquire new technical and scientific concepts and to learn new exactitudes of time, volume, distance and dimension. The 'sun high in the sky' or 'low in the sky' must now be appreciated in hours, minutes and for nursing, in seconds. The poetic and leisurely *Mashome a robang meno e mebedi a metso a robang meno e mebedi* (Ten, break off 2 fingers and another breaking off of 2 fingers) must be understood as the precise 88 if pulses are ever to be accurately counted!

Until time and advanced education bring an intellectual cadre of African people who can manipulate their mother tongues to build up a scientific terminology (in which they will be inspired by the long struggle of the Afrikaner intellectuals) it is important that the language of instruction be properly understood.

(*e*) *Naïveté*: Unspoiled simplicity marks the majority of young students, with the exception of a few city sophisticates. In a recent new group 11 saw their first cinema film in the College.

'There were things and people moving much faster, even before I could see what they were doing. There was someone talking, although I couldn't see him, I looked round with an intention of seeing him.'

Contact with books has been very limited. The average number of books in the homes of 33 students questioned was stated to be less than 2 dozen, the majority mentioning 8–10 books.

In a group of 26 students, 14 had lived for some part of their lives in the traditional mud huts, 9 had slept on sleeping mats, 15 had used wood-ash as a tooth cleanser, most had had experience of the most primitive types of latrines. Only 9 slept with open windows.

From this background they move into the hospital environment, take responsibility for using expensive types of equipment and conform to much higher hygienic standards.

The nature of the profession they have chosen demands high powers of reasoning and an assessment of qualities and intangibles. The limited opportunity they have had to develop a critical faculty makes the marked progress in this direction surprising and encouraging.

Change of Belief. Perhaps the greatest transition of all is in belief. The nurses themselves, newly introduced to the concepts of Western scientific medicine, must take its precepts and interpret them to their own society, having first made, to a lesser or greater degree, the necessary adjustments to their own heritage of beliefs.

With some exceptions these beliefs have not been analysed and most ideas of the causation and therapeutics of disease are quite ill-defined. What they have, however, is largely non-scientific and tends to follow the old traditional patterns. Some of these beliefs may be in direct opposition to the teaching of Western medicine. The nursing education of this student must be broad and go deep, if there is to be a real and not just a theoretical acceptance of the principles underlying contemporary medical and nursing care. Perhaps the first necessity is that the teacher should accept these beliefs as valid to the believer and treat both with respect, and without a sense of personal superiority. Ridicule builds up iron curtains of reserve behind which the entrenched belief remains inviolate.

Open discussions with a class on old methods of diagnosis and treatment can usually bring about some re-orientation of belief if the group gives its approval of some newer concept or its disapproval of an older idea. This group reaction is necessary, as others have also found.

'All peoples . . . have their own theories about maintaining health and curing disease. These theories may provide feelings of as much security for those who hold them as do the explanations based on modern science.'[3]

The application of goat dung to the skin of a child suffering from measles will probably retain some aura of mysterious power until a discussion on the danger of tetanus or other infection elicits a combined group disapproval of the practice.

It must be remembered that the nurse being trained is herself an educator and she in turn should acquire something of the skill of re-orietating the belief of her society. This is particularly important with regard to the need for early diagnosis and treatment being undertaken by qualified doctors in the first place, and not being resorted to when other methods have failed.

Assessment of Success. Criteria of success are difficult to establish. At the educational level examination results will be discussed later.

The success of those who continue as Staff-Nurses and later become Sisters can only be judged by those who have a sufficiently deep individual knowledge of a sufficiently large number of these professional women to assess their qualities without crude or sweeping generalizations. Then the answer is very simple. They are like any group of persons anywhere,

a few of outstanding personality, many of average ability, some quite indifferent in quality, and a few really poor.

Their social *milieu* provides little incentive to maintain high standards of behaviour. African women have not yet received full recognition of their independent status in relation to men. The social revolutionary process which took place in Britain in the early years of the century with explosive force, is being duplicated at a much quieter and more evolutionary pace in their own society.

There is also the much wider lack of recognition of status which affects even the most educated and evolved of their society. Behaviour which is appropriate to professional status can only be concomitant with the full granting of that status.

Most African trained nurses are married and their lives are complicated by inadequate transport systems; by housing shortage; by the problems of care and education of their children; and the frequent insecurity of their husband's jobs.

Many fears dominate their lives, such as sudden arrest of their men folk; the crime, violence, assault and terrorism amongst their own people; and fear of restrictive social legislation. Some fears are well founded, many are exaggerated, but all are present and must affect the quality of professional service given.

The ability of these women when on duty to remain calm and unflurried and to continue indefinitely in trying situations, can evoke only the greatest admiration. When breaking point is reached, however, reactions can be extreme.

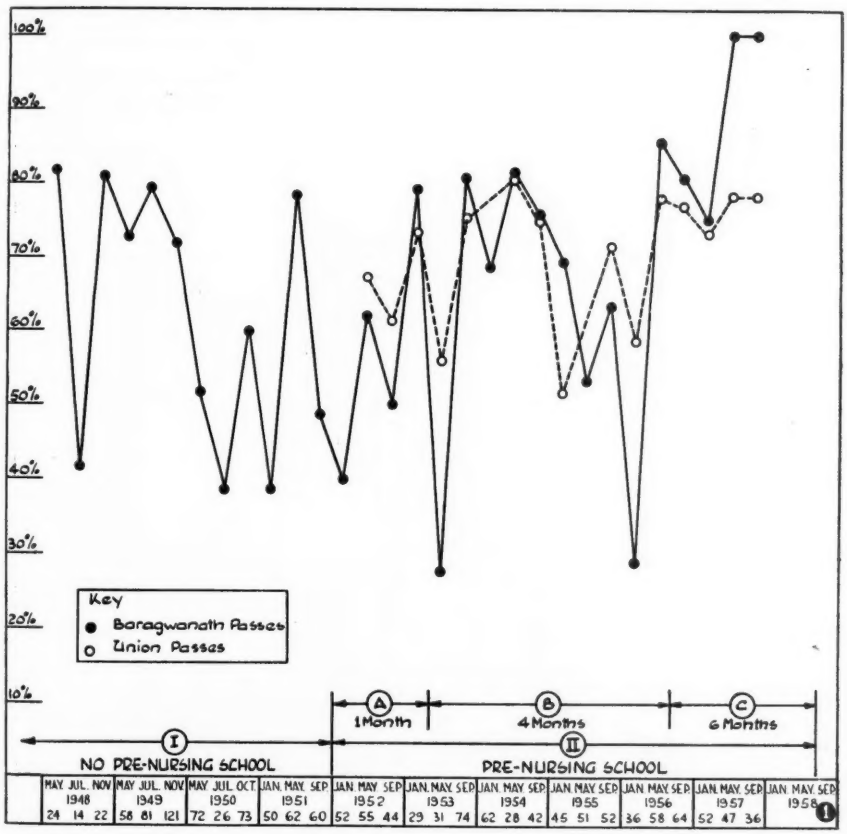


Fig. 1. Preliminary Examination Results (Passes).
The numerals in lowest line indicate the number of entries for the examination.

THE NURSING EDUCATION PROGRAMME

The Nursing College, situated in the grounds of the hospital, has about 650 students at any one time and over 900 students annually.

The training given conforms to the standards of the South African Nursing Council and the syllabus is that which is followed by all Nurses training in South Africa for the Medical and Surgical Nurse Certificates. This basic nurse training covers a period of 3½ years.

Within the broad and general outline of the prescribed syllabus, the particular needs of the patients are stressed. In this the educators themselves have had to learn to make an adjustment from the needs of their own society to an awareness of the needs of another. In the teaching there is an increasing emphasis on subjects such as infant and adult nutrition, tuberculosis, the need for early recognition and treatment of disease, realistic hygiene, and so on.

This slightly different emphasis is probably no different from the variations of emphasis that are placed on different aspects of the syllabus in training schools in different parts of the country. Bilharzia is, for example, of more importance in the Transvaal and amoebiasis probably receives more emphasis in Natal.

In planning a syllabus for a country of such diverse conditions as South Africa, it is important that it retain a flexibility so that different aspects can be stressed according to local conditions.

Ten years of training in this Nursing College have produced the conviction that once the initial educational and adjustment needs of the students have been met in the Pre-Nursing

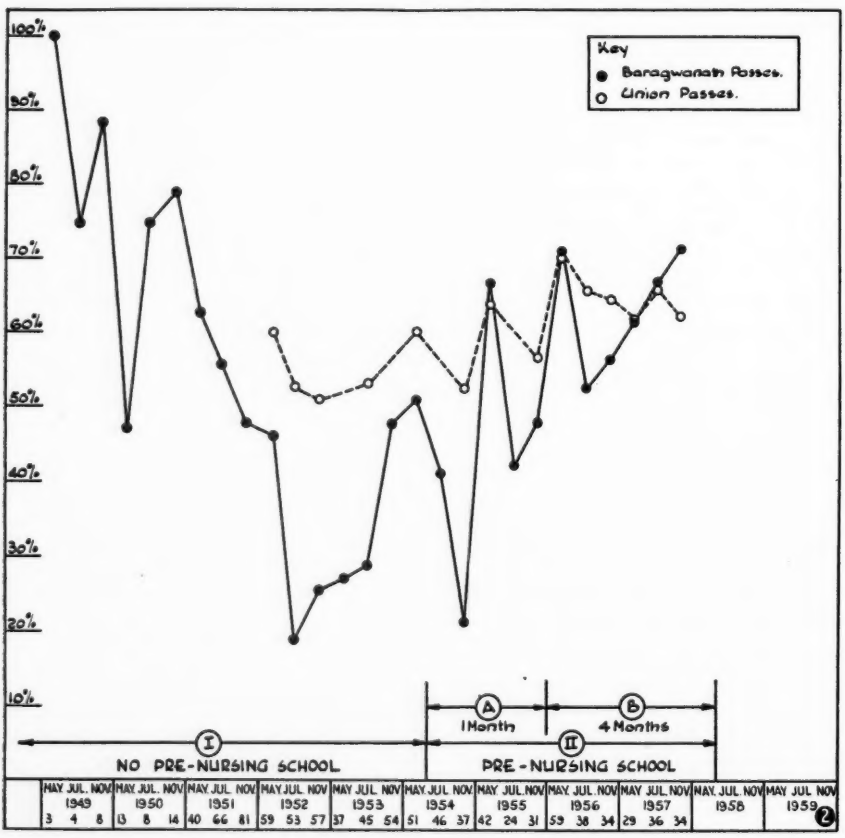


Fig. 2. Final Examination Results (Passes).
The numerals in lowest line indicate the number of entries for the examination.

Course (discussed later) there is absolutely no need to consider a special syllabus to meet the needs of African nurses. What is required is a flexibility and a sensitivity on the part of the interpreters and teachers of the subject matter of the syllabus.

The Plan of Teaching. Following the Pre-Nursing Course the students enter the Preliminary Nurse Training School for a period of 2 months where they are given their initial nurse training before entering the Wards. Their registered period of training begins at this stage.

Thereafter the system followed is the 'Study Day System.' This consists of a weekly attendance of a day at the Nursing College for periods of 5–6 months in each of the 3 years of training and 3 months in the last 6 months. During the interim periods the student does her periods of night-duty and has her annual leave.

During this training 2 Nursing Council examinations are taken, the Preliminary Examnation and the Final Examination which has two parts, a written and a practical part.

Review of the results of these examinations during the life of Baragwanath reveal points of interest.

The Preliminary Examination. Fig. 1 may be divided for comparative purposes into two sections:

(1) From May 1948 to September 1951;

(2) From January 1952 to September 1957.

In the first period there was no Pre-Nursing School. In the second period a Pre-Nursing School was introduced in 3 stages: (*a*) for 1 month; (*b*) for 4 months; (*c*) for 6 months.

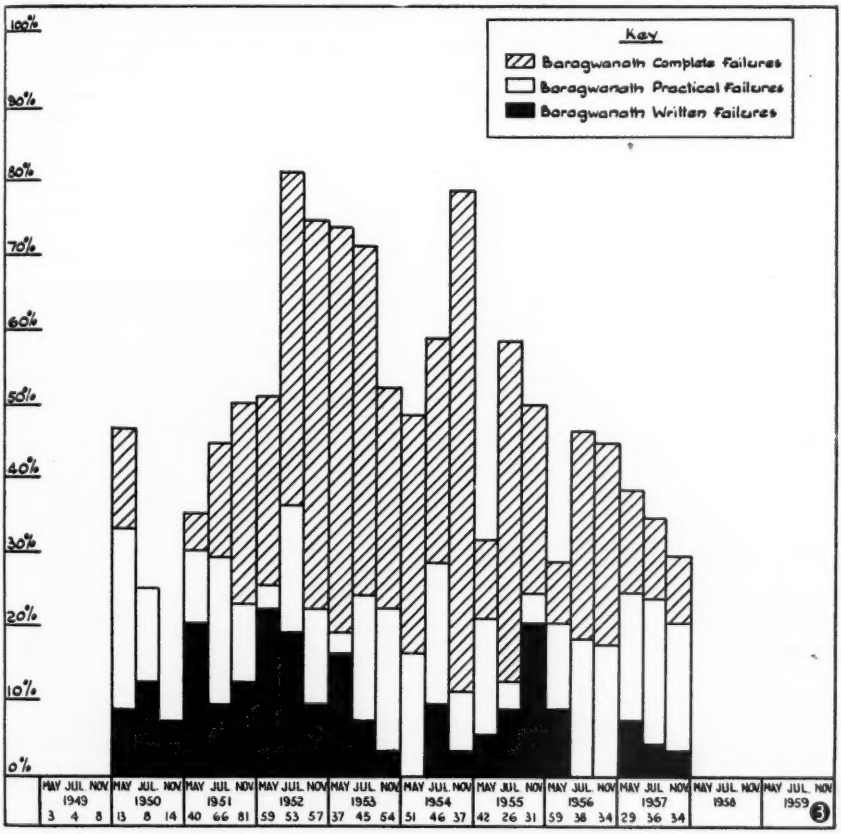


Fig. 3. Final Examination Results (Analysis of Failures).
The numerals in lowest line indicate the number of entries for the examination.

During the first period there was a general decline in the pass rate, partly coinciding with increasing numbers of students.

During the second period the pass rate increased fairly consistently and bears a relationship to the increasing length of time of the Pre-Nursing School. The two marked depressions in May 1953 and January 1956 both occurred at the point of a change in the length of the Pre-Nursing Course. The elimination of these depressions produces a steadily climbing graph.

The number of students with an Honours pass has also increased. The first Honours pass occurred in November 1948 and since then 74 students have achieved this.

There appear to be 3 main reasons for this rising pass rate:

(1) The educational standard of the nurses was improved (discussed later);

(2) The selection of students before registration became stricter.

(3) There had been more time for adjustment.

Selection of Students: This is done at three levels. The 250–300 annual candidates for the Pre-Nursing School are sifted from the total bulk of applications. The criteria are educational standards, subjects studied (English A, Arithmetic and/or Mathematics, General Science), headmasters' reports, testimonials and, when possible, an interview.

The main selection is done before entry into the Preliminary Training School from the Pre-Nursing School. This is done on the basis of test and examination results and personal observations of all the teaching staff of the Pre-Nursing School embodied in confidential reports.

Students of doubtful potentiality may be warned and allowed through to the Preliminary Training School and re-assessed before being registered as student nurses.

Wastage rates at this level are as follows (figures for 18 classes):

From Pre-Nursing School to Preliminary Training School ... ... 13.7%.
From Preliminary Training School to Registration as students ... ... 6.5%.

These figures are not only selection figures but include students who have left for personal reasons.

Adjustment: This cannot be assessed, but the general impression is that students have become more mature.

Final Examination (Figs. 2 and 3). Analysis of the Final Examination Results shows that during the period 1948–49 the pass rate was high but the number of entries very small (between 4–8 students) which made individual coaching possible.

Throughout the period 1950–53 the number of entries rose steeply with a decreasing pass rate, the lowest level being reached in 1952. These students had had no Pre-Nursing Course, nor was individual coaching possible. They had been admitted, with relatively little selection, in large numbers when Baragwanath Hospital opened. In addition there was little compensatory increase in the trained staff of the Hospital at that time. The number of trained Sister Tutors has consistently been below strength, at times reaching a critical level of inadequacy. The number of lectures given has always been the minimum required by the S.A. Nursing Council.

From the low level of 1952 there has been a steady upward climb. During 1957 the Union average (for all races) was exceeded.

The whole picture here presented is highly encouraging. Rote learning which may play a part in the Preliminary Examination is not possible at this level because of the extent and diversity of subject matter. Consisting of two parts, a written and practical, the examination is a good test of all-round ability.

In 1951 the first Honours in the Practical portion occurred, and between then and November 1957 there has been a total of 10

Fig. 4. Miss J. McLarty, first Matron of the Baragwanath Hospital, 1948-1953.

Honours. The first Honours in the written portion of the Examination occurred in November 1957.

The Pre-Nursing Course. At the beginning of 1952 this course was instituted, through which all students were required to pass. Miss J. McLarty,* first Matron of Baragwanath (Fig. 4) gives the reasons for this course.

'This course was inaugurated as a preparation and selection course. Twelve years of experience in Non-European nursing education had shown that much avoidable wastage occurred, that this included the loss of many potentially good nurses, while among those who qualified were some who while technically skilled were not well prepared in other ways for the responsible work of the registered nurse. It was clear that many of these difficulties stemmed from an imperfect and superficial knowledge of the language of instruction, from a general superficiality of education and from the too rapid transition from a background which did little or nothing to prepare young women for the high degree of personal responsibility they were expected to assume as nurses.

There should be a period for preparation and adjustment. In this period there should be an extension of general education especially in language, applied arithmetic, elementary general science applied to nursing, general knowledge and social science. In addition the foundation of basic care for the sick should be laid, the work of the hospital be related to the community, and to the health services and guidance given in personal relationships and in standards of professional conduct.'[4]

A period of 5 years is too short to have produced much concrete evidence to justify the Pre-Nursing Course. There is quite definitely an improvement in the pass rates of the S.A. Nursing Council's examinations. It is generally felt that there is an improvement in the standards of practical work. Elimination in the early stages of those who obviously cannot cope with training at the higher level certainly reduces the over-all wastage.

Teachers in the nurse training department who have lived through the two periods feel that senior teaching is now being laid on firmer foundations.

General Wastage. Wastage figures to be of real significance require detailed study. The following data from 6 classes (168 students) in 3 consecutive years are, however, of interest:

% Wastage from the Pre-Nursing School to Final 56.2%;
% Wastage from Preliminary Training School to Final ... ... 52.9%.

Wastage is high, but these figures are taken at the beginning of the Pre-Nursing Course experiment.

It is important to bear in mind that even partial nurse training cannot be counted a waste to society as a whole.

THE FUTURE

The future of African Nursing, speaking materially, is full of promise.

The scope of training within this particular Nursing College is being extended in all directions. Midwifery training is being planned. A new post-basic Nursing Education Department will come into force as soon as several new and large building projects materialize. Facilities will be provided for the training of Sister Tutors for a Diploma Course. This will provide a new opportunity for African Nurses to progress. Other post-basic courses in Operating Theatre Technique, Paediatrics and Orthopaedic Nursing are being planned.

A course in radiography is already in existence for registered Nurses and at a future date training courses will probably be offered in other ancillary medical services.

All this is good. It shows vision and foresight and it shows that the Provincial Administration has confidence in the ability of the nurses to benefit from these new forms of training. It augurs well for the improvement in the health of the African population.

To conclude at this point, however, would be to over-simplify the situation and to be quite unrealistic.

The Challenge. Within the structure of the nursing profession, as indeed in the world as a whole, there are enormous stresses and tensions. It is as if a world were dying and a new one struggling to be born. Processes of change are taking place at a rate never before experienced.

Education, which was once given in order to perpetuate old established forms of living and behaviour, has not prepared people for acceptance of new and radical changes. A change of heart and a new educational approach is needed in nursing and the words of Margaret Mead in relation to child care are very apposite. She says of a child that he must learn 'to sleep trustingly in new places, because he

* Miss J. McLarty, Matron of the Non-European Hospital in Johannesburg from 1939 until it moved out to Baragwanath Hospital in 1947 and thereafter of Baragwanath Hospital until her retirement in 1953, is one of the pioneers of African Nurse education in the Transvaal and as such she received the award of the Florence Nightingale Medal, the highest award of the International Red Cross, on 17 August 1955 from the hands of the Governor-General of South Africa, the Hon. Dr. E. G. Jansen at a ceremony at Baragwanath Hospital.

This knowledge of African Nurse education has been used by the World Health Organization for two assignments since Miss McLarey's retirement; one in Equatorial Africa and one in Singapore.

has learned to trust even in a world that is not fixed and predictable.[5]

The world for African nurses is not 'fixed and predictable.' Their own culture has been disrupted. They have not all succeeded in making the adjustment to the new without psychological trauma, often shown in aggression and resentments.

The world for White nurses is also not 'fixed and predictable.' They too are faced with challenges to the old established ways.

The doors of their profession were opened to members of another race, who up to that point had had little chance to benefit by a professional training. They have responded to this training. Now, like any group of persons nearing maturity, there is a demand to have the full recognition of this maturity.

This is a deep challenge and if there is the courage to meet it the future will certainly not be 'fixed and predictable'; but if the trust is there, it can be safe. If the challenge is not met there is danger that the future will be neither fixed, predictable nor safe.

The African nurses form a core of influential women in their society. They have high prestige. Working in unity and harmony, they can be a stabilizing force in the welter of change in their own society. If this unity is not found then disruption will occur.

OPSOMMING

Die Baragwanath-hospitaal verskaf hospitaal-, buitepasiënt- en kliniese dienste aan byna 400,000 persone. Dit is 'n mediese navorsingsmiddelpunt en een van die grootste sentrums vir die opleiding van nie-blanke verpleegsters in Afrika.

Daar is 650 studente aan die Verpleegsterskollege. Die meeste van hulle is naturelle, maar daar is ook 'n paar kleurlinge en Indiërs. Die minimumvereiste is Junior Sertifikaat. Faktore wat die opvoeding van die leerlinge belemmer is: 'n ondoeltreffende kennis van die taalmedium waarin die onderrig geskied; beperkte geleenthede vir die lees van boeke en die uitbreiding van kennis; ongelukkige huislike omstandighede; beperkte geleenthede vir die aankweek van 'n verantwoordelikheidsin of die beoefening van 'n eie oordeel, en 'n algemene eenvoud van omgewing.

Die opleiding en eksamens stem ooreen met dié van alle verpleegsters wat onder die S.A. Verpleegraad opgelei word. Voordat die leerlinge met hul 3½ jaar lange opleiding begin, loop hulle 'n 4 maande algemene onderrigkursus wat die verplegingskursus voorafgaan. Dit bied hulle ook 'n kans om hulle aan te pas. Sedert daar in 1952 'n aanvang hiermee gemaak is, het die eksamenresultate heelwat verbeter, en in die ses eksamens wat in 1957 afgeneem is, was die persentasie leerlinge wat in die Voorlopige sowel as die Finale eksamen geslaag het net so hoog of selfs hoër as die gemiddelde vir alle rasse in die Unie.

Toenemende verantwoordelikheid word aanvaar. Vanaf 1953 tot 1958 het die aantal blanke Saalsusters van 23 tot nul gedaal, en die aantal nieblanke Saalsusters het van 6 tot 29 gestyg. Die eerste Bantoe-matrone is aangestel, en betrekkings vir ander matrones is geskep.

Die hospitaalbedrywigheid het terselfdertyd met byna 100% toegeneem. (In 1957 is 39,631 pasiënte toegelaat en 994.8 persone is elke dag by die Buitepasiënt- en die Ongevalle-afdeling behandel.)

Maatstawwe is in stand gehou, en hoewel die toekoms ongetwyfel sy probleme sal oplewer, is dit nogtans belowend.

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NOTES AND NEWS : BERIGTE

Dr. Sidney Sacks left Johannesburg recently to attend the Orthopaedic Congress in Washington, U.S.A.

He will spend 3 months on a post-graduate study tour of orthopaedic centres in America, Canada and Europe. He will be back in mid-July.

* * *

MEDICAL SOUND FILMS

Westdene Products (Pty.) Ltd., 23 Essanby House, 175 Jeppe Street, Johannesburg, will be pleased to loan, free of charge, medical sound films, 16 mm., to interested doctors and professional groups. Telephone 23-0314.

Sidney L. Kark, Professor of Social, Preventive and Family Medicine in the Faculty of Medicine of the University of Natal, has been granted leave of absence for a period of one year by the Council of the University. A similar period of leave of absence has been granted to Dr. Emily Kark, Clinical Tutor in the Department of Social, Preventive and Family Medicine.

Professor Kark is to take up an appointment as Professor of Epidemiology at the School of Public Health at the University of North Carolina.

REVIEWS OF BOOKS

MEDICAL TREATMENT

Textbook of Medical Treatment. Ed. by D. M. Dunlop, Sir Stanley Davidson and S. Alstead. 1958. (Pp. 894 + Index. 55s.). 7th ed. Edinburgh and London: E. & S. Livingstone Ltd.

Since the last edition of this well-known volume in 1953, so many new drugs have come into popular usage that a new edition must be welcomed by all those in general practice. As with earlier editions, the medical practitioner and the student will find a clear and practical guide to most of their problems.

The chapter on corticotrophin and cortisone by Professor Dunlop is most useful and stresses the fact that the initial period of excessive optimism, when cortisone was regarded by many as a 'wonder drug,' has been superseded by the view that although it is not to be regarded as a 'general panacea,' it can be of great value when wisely used.

The chapter on the newer antibiotics will be useful to the practitioner overwhelmed by never-ending lists of new products.

The problem of hypertension is discussed fully and the most desirable method of treatment of the various grades is explained in detail. Those not fully acquainted with the actions of the newer drugs will find this chapter most helpful. The authors stress the importance of the non-medicinal aspects of treatment, such as the general management of the patient and the need to employ common-sense, psychological principles which the young doctor tends to overlook, relying too much on the armamentaria of drugs so numerous in our day.

It is not possible to review every item in the list of important and excellent contributions. This volume is certainly a *must* for every young practitioner and student. It will also be found invaluable by those looking for a concise and authoritative account of modern management and treatment.

POST-MORTEM ANGIOGRAPHY

Atlas Postmortaler Angiogramme. By Dr. J. Schoenmackers and Dr. H. Vieten. 1954. (Pp. 191 + Index. Illustrated.). Stuttgart: Georg Thieme Verlag.

The thoroughness which has been applied to this study is impressive. The book is written in German, and each section has a reasonably adequate summary in various languages. The English summary is grammatically poor, and at times the wording of sentences precludes a clear understanding of the authors' meaning.

The illustrations throughout the book are excellent, as well as they should be, the subjects being inanimate, no limitation to the concentration or nature of contrast medium being present.

The book is divided into angiograms of the lungs, the bones, the heart, the kidneys, the foetus, the main stem arteries, and portal and systemic venograms.

In the pulmonary angiograms, many of the conclusions arrived at confirm views already accepted and which can be obtained from the conventional teleradiogram. However, the studies of carcinomatous lesions are of interest. They appear to indicate the need of more or less routine catheterization of the right ventricle and the performance of a pulmonary angiogram in those cases of pulmonary masses which present a diagnostic problem. The cerebral angiograms do not really add anything of significance to what is already known (and derived from the fairly general application of carotid angiography).

In the section on heart angiograms, the anatomy of the coronary arteries in normal and pathological states is adequately covered. A practical application of this study is, however, not possible until such time as a completely innocuous high contrast medium is made available.

Renal angiograms do not cover malignancy, a surprising omission in view of suspected renal neoplasia as one of the major indications for renal arteriography.

The authors' impression that the cortical congestion in ischaemic kidney diseases is due to contraction of the kidney is of interest. No comment is made on the presence or absence of arterio-venous shunts.

The section dealing with congenital heart disease does not, as the authors' point out, present a true pattern, owing to the effect of haemodynamic variations in the living subject.

Studies of foetal circulation in siamese twins are of interest and the angiograms in portal hypertension due to various causes are informative. The authors include diagrammatic representations of the numerous portal systemic collateral pathways in portal hypertension.

This book serves as a most useful reference source, and is of particular interest to those concerned with the radiological study of vascular disease.

DIAGNOSIS OF THE ACUTE ABDOMEN

The Early Diagnosis of the Acute Abdomen. By Sir Zachary Cope, B.A., M.D., M.S. (Lond.), F.R.C.S. (Eng.). 11th ed. 1957. (Pp. 184 + Index. With 36 Figs. 18s.). London and Cape Town: Oxford University Press.

This book, first published nearly 40 years ago, has now entered its eleventh edition, with further revisions by its distinguished author.

There is more to modern surgery than skilled techniques and the application of modern biochemical methods, and these pages reveal how essential for the patient's welfare is the art of surgical diagnosis. Applied to the principles of abdominal surgery, and the acute abdomen in particular, no clearer or more impressive introduction to the principles and methods of surgical diagnosis exists.

The methods of history taking and examination, and the interpretation of symptoms, are models of their kind.

The detailed description of appendicitis and its manifold variations is a pleasure to read. This chapter, together with those on perforations, intestinal obstruction, and the early diagnosis of strangulated herniae, are the essence of the author's long experience and cannot be bettered.

There are, in addition, chapters on colics, the early diagnosis of abdominal injuries, abdominal diseases associated with pregnancy and the import-

ance of genito-urinary symptoms in acute abdominal conditions.

New chapters have been added on neonatal obstructions, vascular conditions causing acute abdominal symptoms and a final essay on conditions simulating the acute abdomen. There is, too, a chapted devoted to the synthesis of groups of abdominal symptoms and signs as a guide to diagnosis, which is of great practical use.

The line drawings are clear and uncluttered, and the X-ray reproductions are quite outstanding. The whole production, priced at 18s., is a tribute to medical publishing.

Whilst there are some statements which may not necessarily accord with the individual surgeon's experiences, criticisms of such a nature are unnecessary. A number of physical signs in abdominal disease universally taught to-day were introduced by Sir Zachary Cope, such as the obturator test for appendicitis, but the main claim of this book to rank as a valuable contribution to surgery lies in its masterful presentation of the foundations of surgical principles, and the education of the student, the teacher and the surgeon is not complete without it.

BURNS

Burns—Pathology and Therapeutic Applications. By Simon Sevitt, M.D., M.Sc., M.A., F.R.C.P.I., D.P.H. 1957. (Pp. 335 + Index. With 85 Figs). London and Durban: Butterworth & Co. (Publishers) Ltd.

This is the first book which deals comprehensivley with the pathological changes following burns. It is a complete and up-to-date review of this subject. The author is Consultant Pathologist to the Birmingham Accident Hospital and M.R.C. Burns Research Unit, and therefore his views reflect their practices. This lends to them a stamp of authority. The opening chapters, dealing with the inflammatory changes, the histology of burned skin and the role of infection, are excellent and they make clear many of the puzzling clinical features seen in the early burn period.

Burn shock is dealt with thoroughly and the convincing case is well presented that most, if not all, the features of so-called burn toxaemia can be explained on the basis of oligaemia, electrolyte disturbances, renal ischaemia and the metabolic responses to injury. The later complications of burns, such as anaemia, poor nutrition and infection, are adequately covered. A chapter is included dealing with the expected mortality in age groups, after the work of Bull and Fisher.

The wide-spread effects following burns, on the gastro-intestinal tract, the kidneys and the liver, are fully dealt with. The final chapters deal with atomic burns and burns from X-rays, radio-active substances, electricity and chemicals.

The book is a source of much information and many views, but many chapters are difficult to read because of the number of references and the often conflicting opinions quoted. The author, having presented the research results of others, does not always indicate what his views are.

The book deals in principle with therapeutic applications. Although it is commonly held that patients no longer need die of burn shock in the early post-burn period, this is not always true and there are still problems in fluid therapy which might with advantage have been discussed.

The author's comments on the use of cortisone and ACTH that 'There is no place for the routine administration of these drugs as "replacement" therapy,' should help finally to eliminate the use of these dangerous drugs in burns.

This is a well produced book and is of real value to all surgeons, registrars and practitioners who deal with the problems of burns.

THE AUTONOMIC NERVOUS SYSTEM

British Medical Bulletin. Autonomic Nervous System. Vol. XIII, No. 3, September 1957 (completing the Volume). (Pp. 153—230. 20s.) London: The British Council, Medical Department, 65 Davies Street.

With this number the publishers conclude Vol. XIII. The survey of the *Autonomic Nervous System* is introduced by Sir Henry Dale, Nobel Prize winner, who has made this subject his special field of study. The following topics are included:

Acetylcholine Metabolism at Nerve Endings (R. I. Birks and F. C. MacIntosh);

Formation of Catechol Amines in the Animal Body (H. Blaschko);

Sympathomimetic Amines in the Central Nervous System (Marthe Vogt);

Humoral Transmitters and Smooth Muscle (Edith Bülbring);

Mode of Action of Autonomic Transmitters on the Heart (O. F. Hutter):

Acetylcholine and Cardiac Fibrillation (J. H. Burn);

Pharmacological Properties of Sensory Receptors (J. A. B. Gray and J. Diamond);

Functional Vasodilation in Salivary Gland (S. M. Hilton and G. P. Lewis);

Sweating and Sympathetic Innervation (C. Lovatt Evans);

Innervation of Abdominal Viscera (R. C. Garry);

Intermediate Sympathetic Ganglia (J. D. Boyd);

Collateral Sprouting in Autonomic Nervous System (J. G. Murray and J. W. Thompson);

Transmission in Autonomic Ganglia (W. L. M. Perry).

This valuable review is essential for those who wish to understand modern views concerning junctional transmission in the nervous system as a whole.

PROPHYLAXIS AND TREATMENT

Antisera, Toxoids, Vaccines and Tuberculins in Prophylaxis and Treatment. By H. J. Parish, M.D., F.R.C.P.E., D.P.H. 1958. (247 + Index. With Figs. 30s.). 4th ed. Edinburgh and London: E. & S. Livingstone Ltd.

In the preface to the first edition of this book, published in 1948, the author explained his intention of presenting in concise form for the use of practitioners and students the essential principles of immunology and their practical application. This objective has clearly been achieved.

In recent years immunization has played a very significant role in the curtailment of illness and the saving of life. The important advances which have been responsible for these results are clearly set out and brought up to date in this new edition.

Much has been written on the subject of virus vaccines and poliomyelitis vaccine in particular. The

author states that 'an appreciable immunity is conferred in most cases' receiving poliomyelitis vaccine. He goes on to discuss whether or not this protection is long-lasting and the advisability of a boosting injection.

The chapter dealing with BCG immunization is of particular interest to those concerned with the control of tuberculosis in this country. In spite of the apparently favourable conclusions of the Medical Research Council in this connexion, the author's conclusions do not indicate a whole-hearted support of mass BCG vaccination, but suggest its possible (limited) application only to certain groups.

The author also surveys the important advances made in the preparation of rabies vaccine cultures in chick embryo. This gives more durable and increased protection than do other vaccines. Even more significant, however, is the likelihood that undesirable allergic, systemic effects or neurological signs referable to brain tissues will now be obviated. Duck-embryo-propagated vaccine is also under investigation. It seems certain that bird-embryo-propagated virus will now replace virus produced by growth in rabbit or sheep brains for the manufacture of the vaccine. Indeed, avian products are already available commercially and will lend greater confidence to the use of rabies vaccine.

Bacterial vaccines, antivenoms, antitoxins in general, Schick and Dick testing, active immunization against staphylococcal infections, tetanus and gas gangrene are fully reviewed.

An interesting historical chapter, set out in chronological order, concludes this excellent utilitarian account of a most important field of treatment and preventive medicine.

CHEST SURGERY: AN INTRODUCTION

An Introduction to Chest Surgery. By Geoffrey Flavell, F.R.C.S. (Eng.), M.R.C.P. (Lond.). 1957. (Pp. 342+Index. With 49 Figs. 30s.). London: Oxford University Press.

With the development of specialities in surgery there have come a number of monographs on individual pathology and diseases and, keeping pace with this, detailed technical books devoted to a narrow field. Chest surgery to-day is a speciality which embraces on the one hand the highly skilled techniques of heart surgery, dependent on team work with physicians and, on the other hand, the equally special techniques of gastro-intestinal surgery and lung surgery. The tendency is now to refer standard investigations, such as oesophagoscopy and bronchoscopy to the chest surgeon and consequently many of the conditions which up to 10 years ago were common procedures in a general surgeon's repertoire, e.g. the treatment of empyema and the surgery of the oesophagus, are becoming confined to the field of the chest surgeon.

One result of this has been the publication of books on chest surgery which, whilst excellent for the specialist in the branch, have failed to place chest surgery in perspective for the undergraduate student. This book fills the role of undergraduate instruction very well. It is written by a chest surgeon attached to the London Hospital and, as his *Introduction* indicates, he has left little scope for diversity of treatment, but has deliberately introduced a note of dogma based on his personal experience, as a guide to students. Two thirds of the book are taken up with a discussion of the diseases of the lung. This part is simple, straightforward, well written and easily digestible. Some of the excellent chapters include the techniques of bronchoscopy, and one on *How to Read an X-ray*. Injuries of the chest are well described and the chapter on empyema is among the best in the book. The author summarizes the available evidence of the role of tobacco in the genesis of carcinoma of the lung and presents a convincing case of the undoubted association between the two.

The chapters on the oesophagus are less satisfying. In particular, strictures of the oesophagus are summarily dealt with and much valuable recent work, particularly from this country, is not mentioned. The surgery of the heart and the great vessels is adequately dealt with, but it is surprising that only passing mention is made of the present position of open cardiotomy and the physiological problems involved. This field of surgery is opening so many new approaches that a brief description would have been welcome.

This excellent book is priced at the extraordinarily low figure of 30s. and the X-ray reproductions are the best that have appeared in many a textbook.

The book is highly recommended for students and presents a concise and practical view of thoracic surgery to surgeons not primarily in the field.

MEAKINS' PRACTICE OF MEDICINE

The Practice of Medicine. Ed. by Jonathan Campbell Meakins, *C.B.E.*, M.D., LL.D., D.Sc. 1956. 6th ed. (Pp. 1,843 + Index. With 318 Illustrations, including 4 in colour. 136s.). St. Louis: The C. V. Mosby Company.

Although specialization in medical practice has proceeded to remarkable lengths, the basic need for general account of the ills of Mankind, within the ambit of a single volume, remains a necessary and essential requirement for the student as well as the general practitioner.

It has, of course, become increasingly difficult for any single author to cope with the vast body of knowledge which comprises modern medical practice. As the Editor himself points out in a lively preface:

'There has been an increasing trend that professors of medicine should be specialists in some branch of their profession. It would follow, therefore, that their personal teaching should tend to be along these these lines. That is excellent for the graduate st dent, but is it in the way of wisdom that undergraduates should be taught by a group of specialists? Who is to fill in the odds and ends of the multifarious lesions and syndromes which do not fit but the professor of medicine? Such a man must be able to discuss the fundamental concepts at the bedside and inspire in the student or practitioner a grasp of the art and science of medicine. Also, the task of healing the physical disabilities and of recognizing the emotional factors that predispose to and result from such complex integrations must fall to him.

The laboratory workers can contribute, but their results are not to be taken too seriously at times when these do not conform with the whole pattern of the functional derangement or syndrome. In fact many symptom-complexes cannot be proved to have a factual physiologic, anatomic, biochemical, or psychologic basis. All of these may contribute to the common end, but they must be integrated to apply to the individual as a composite being.

To accomplish this objective, the teacher of medicine must be in constant contact with humanity in the *raw*. He cannot be one who is removed from the bedside or from the outdoor departments where he can be stimulated and inspired by the younger generation, and where he can act as a flywheel to keep the practice of medicine at an even speed, so to speak, when the enthusiasms and narrow outlook in special branches are apt to ignore the broad principles of medicine.'

Professor Meakins has chosen as the proper solution of his problem the policy of extending his Editorial Staff to include a large number of distinguished Associate Editors. The result has been a very careful scrutiny of the content of each Section which, in turn, has been subordinated to a master plan which ensures an integrated text.

The enormous advances in the field of antibiotic therapy have provided an opportunity to set out an expanded section which deals with all aspects of the subject, including indications, specific actions, selection, complications, combinations and, last but not least, misuse. This valuable portion of the volume should do much to remove the considerable confusion which exists in the minds of the many practitioners who qualified and registered before they were taught the principles of antibiotic therapy in the course of their undergraduate studies.

The volume is profusely illustrated in black and white as well as in colour and the abundance of clinical photographs should do much to assist the student reader.

Some of the diagrams, especially in connexion with the nervous system, are particularly illuminating.

Elimination of orthodox psychiatry from textbooks of general medicine has made mandatory the inclusion of a section on the psychosomatic aspects of medicine. This should restore a sense of proportion to the student of disease and make him appreciate the very great role which everyday psychotherapy plays in general practice.

This volume has been extremely attractively written and produced. It should find a ready place on the student's bookshelf.

ANTIBIOTICS: CLINICAL APPLICATIONS

The Clinical Application of Antibiotics. By M. E. Florey, M.D. 1957. Vol. III. Chloramphenicol and the Tetracyclines. (Pp. 381 + Index. 84s.). London: Oxford University Press.

This outstanding contribution, from the pen of a distinguished pioneer in the field of antibiotics, surveys chloramphenicol and the tetracyclines. The scope of the volume is very considerable and is a mine of clinical information to the practitioner.

Very great care has been exercised in the attempt to evaluate both the therapeutic efficacy of the antibiotics (a difficult problem in clinical trials) and the true incidence of complications or toxic effects. This latter problem is well brought out in the section dealing with chloramphenicol and blood changes. 'Reports of 539 cases of anaemia following treatment with chloramphenicol were collected mainly from cities with a population of more than 100,000. Chloramphenicol alone had been given to only 55 patients. . . . Both the dosage of chloramphenicol and the number of courses of the drug given varied, but no one régime seemed more harmful than the others. The incidence of haemopoietic disorders was higher in females than in males, but all age-groups were affected. Since, during the period between 1949 and 1952, there was a generalized increase in the incidence of blood dyscrasias in the United States, the figures above do not provide sufficient evidence for stating that the instances of anaemia recorded in this report were necessarily due to chloramphenicol. Nevertheless, it was advised that the drug be used only in cases where is was definitely indicated and not for minor infections (*Council on Pharmacy and Chemistry*, 1954).'

Another investigation revealed that 'although 1,448 records of cases of blood dyscrasias had been collected from various parts of the United States, only 88 of these had received chloramphenicol before the dyscrasia was recognized, and not more than 29 had received chloramphenicol without any other drug. Although useful in that they demonstrated that the warning on the containers of chloramphenicol had had its effect, these investigations provided no acceptable information about the incidence of blood disorders resulting from administration of the drug.'

The position is not made any easier when it is appreciated that the symptoms in a given case 'may have been evidence of the onset of a blood dyscrasia irrespective of the administration of chloramphenicol. An example of this seems to have been given by McFadzean and Choa (1953), who found 6 cases of haemolytic anaemia amongst 129 with *Salm. typhi* infection. All these patients were jaundiced when admitted in the second week of their illness, one having haemoglobinuria. Chloromycetin was only administered after this abnormality had been observed. In spite of receiving the antibiotic at a dose of 60 mg. per Kg. of body weight to start with, and daily thereafter for up to 14 days, as well as showing a continued deterioration in the blood picture, the red cell and reticulocyte count and the haemoglobin per cent began to rise before chloromycetin was discontinued and reached near normal values in 6 weeks' time.'

Complex as the situation may be, one principle clearly emerges, viz. that antibiotics should be used only when there is an adequate indication, that they should be used in proper dosage and, where possible, after laboratory confirmation of the susceptibility of the offending pathogen.

CHILDBIRTH

Having a Baby. By J. F. Robinson, M.B., Ch.B. 2nd ed. 1958. (Pp. 98 + Index. Illustrated. 6s. 6d.). Edinburgh and London: E. & S. Livingstone Limited.

This is a short treatise for young married couples contemplating parenthood. It does not moralize and sets out to deal objectively with the problems which confront many young people.

There is a simple account of the anatomy of the genital tract and the physiology of reproduction.

The chapter on contraception provides the layman with a background which will permit intelligent co-operation with the family doctor.

The account of the mechanism of labour and the advice on cultivating relaxation during pregnancy and parturition should do much to remove fear from the mind of the young mother.

The author concludes with a short section on feeding the baby and paying attention to its requirements in its early weeks of life.

This is a manual which medical practitioners may find useful to recommend to their patients.